Policy, Planning, and Research

WORKING PAPERS

Public Economics

Country Economics Department
The World Bank
December 1989
WPS 345

Private Transfers and Public Policy in Developing Countries

A Case Study for Peru

Donald Cox
and
Emmanuel Jimenez

Private transfers within households are affected by such public subsidy programs as social security and health coverage. It is important to monitor this relationship since the impact of these programs, as well as who benefits from them, are also affected.

Policy, Planning, and Research

WORKING PAPERS

Public Economics

Private interhousehold cash transfers are an important source of income in many developing countries. Cox and Jimenez' review of the lieterature indicates that the percentage of households receiving private transfers in a sample of five developing countries ranges from 19 to 47 percent. The amounts transferred are not trivial — they constitute from 2 to 20 percent of income among all households, and 10 to 46 percent of income among recipient households.

Although precise transfer patterns are only beginning to be researched, Cox and Jimenez review the preliminary evidence from other studies and conduct original analysis based on the recent Peru Living Standards Survey. The paper reveals that private transfers are being directed toward vulnerable groups in society. The poor, the elderly, the very young, the disabled, the unemployed, and female-headed households all receive disproportionately more transfers than their share in the population. The results can be dramatic and can do more for the poor than public transfer programs. For example, in Peru, the lowest income quintile's share in total income is increased by 14 percent as a result of private transfers. In contrast, public transfers (mostly social security payments) increase that quintile's income share by only 4 percent.

These transfers are important to consider when making policy that is directed toward certain groups. Increased public spending on, say, pensions or health benefits, could lower private spending. For example, altruistically minded middle-aged households may not give as much to their elderly parents if they know that the state would take care of them. The program could have the unintended effect of transferring purchasing power to the private donor. Also, the value of the public program's benefits accruing to intended beneficiaries would be lower than the amount of the public transfer. Cox and Jimenez provide a conceptual framework to show that these displacement effects become less important if households are also motivated by the expectation that they will get something in exchange, rather than by pure altruism.

Although such private adjustments do offset the impact of public programs, the empirical evidence indicates that it would not completely eliminate them. For example, in Peru, Cox and Jimenez estimate the amount that private transfers from young to old would be raised if social security payments were eliminated. The answer? Private transfers would rise by about 20 percent, but would not completely compensate for the elimination of social security payments. The displacement effect of private transfers is less than that predicted by the purely altruistic model.

This paper is a product of the Public Economics Division, Country Economics Department. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Ann Bhalla, room N10-059, extension 60359 (98 pages with figures and tables).

OUTLINE

The work on this paper was supported in part by RPO 674-49 of the World Bank's Research Support Budget. We wish to thank the Government of Peru and the Bank's Living Standard Measurement Study (LSMS) team for providing us with access to data. Jorge Castillo, Kalpana Mehra, and Reza Firuzabadi were invaluable in setting up workable data files. Fiona Mackintosh edited the papers in this project. We also acknowledge comments from Bela Balassa and participants at a seminar sponsored by the World Bank's Public Economics Division.

List of Tables

List of Figures

I. INTRODUCTION AND SUMMARY

Private inter-household transfers are an important component of household income and expenditures in nearly all developing countries. These transfers serve a variety of social and economic functions, including insurance against income shortfalls, support for the elderly in retirement, educational loans, help during illness and the funds for rural-urban migration. Private transfers help overcome imperfections in capital markets. Some transfers are business loans (or repayments). Thus, a significant amount of redistribution may occur within the private sector.

Policymakers should pay attention to the connection between private and public transfers. Private transfers can affect the formulation of appropriate public policy for a number of reasons. First, private transfers can mitigate or amplify the effect of public expenditures. Depending upon the motive for giving, increased public spending on, say, pensions or health could lower private spending. For example, a public program for old-age support might reduce incentives for younger households to help their elderly parents. The program could have the unintended effect of transferring income indirectly to the young by easing the burden of providing for their parents. Also, the measured impact on recipient welfare would be less than that predicted had there been no private transfer response to the program. Second, public revenue mobilization, such as income taxation may, perhaps unintentionally, affect private giving. Third, government regulation of financial intermediaries may restrict access to formal credit market to such an extent that inter-household transfers take up the slack. Fourth, private transfers may facilitate labor mobility and household migration.

Up to now, there has been little policy-oriented research on this issue, primarily because the scarcity of survey data. Researchers have only recently begun to study private transfers using newly available survey micro-data sets. Empirical work is in its early stages, and researchers are finally beginning to analyze motivations for private-transfer behavior. Our research, partly stimulated by the Bank's special initiatives on poverty and on private sector development, explores the magnitude and determinants of private transfers in developing countries. This paper reviews work done outside the Bank and contributes to that literature with an analysis of private transfers using the Peruvian Living Standard Survey (PLSS), but many findings are relevant for other developing countries as well. The PLSS is particularly appropriate for the analysis because it contains detailed information on income, remittances, consumption, and the use of public services.

The rest of this paper presents four essays (Chapters 2-5) on the topic. Chapter 2 surveys existing literature on private transfers patterns and magnitudes. It finds that private inter-household transfers are an important component of household income and expenditures in many developing countries. For example, case studies in El Salvador, Indonesia, Kenya, and Peru report that about 30 to 50 percent of all households receive transfers. The amounts transferred are also significant. Transfers can be up to 20 to 40 percent of recipient income in many cases. Though inter-country comparisons are difficult, due to disposition of transfers definitions and sample coverage, the bulk of survey evidence indicates that private transfers in developing countries are important in terms of both incidence and amount.

Chapter 3 describes private transfer patterns in Peru using the PLSS data. Private transfers flow from high to low-income households, narrowing income inequality. They follow a pronounced life-cycle pattern, and are targeted toward aged and young households. Households in their prime earning years (mid-forties) are a large source of transfers. Transfers are also targeted toward households affected by illness and unemployment and to female-headed households. Many, but not all, transfers cross urban-rural boundaries. These patterns tend to be similar to those found in other developing countries.

Chapter 4 develops a theoretical framework for analyzing motives for private transfers and provides empirical evidence on transfer motives. A priori, there are at least two possible motives for private transfers. Households might give, with no strings attached, simply because they came about the well-being of members of other households (altruism). Alternatively, households might transfer income in return for some in-kind quid pro quo on future monetary repayment (exchange).

The motive for private transfers will affect the impact of public income redistribution. Altruistically-motivated transfers can offset or completely neutralize the impact of public transfers. The reason is that altruistically-linked spending units (such as a child and parent or a husband and wife) act almost as one consumer would. Changes in incomes of individuals due to, say, a change in public subsidies, would not affect consumption of individual members as long as aggregate income of the altruistically-linked spending unit remained the same. But exchange-motivated transfers interact with public policy much differently, and can even amplify the effects of public transfers.

The evidence from Peru does not support the altruism model. Thus, the effect of public transfer programs is not neutral.

Chapter 5 investigates the link between private transfers and one important public program -- social security. Although the offset may not be complete, private transfers still may mitigate the effect of public transfers. But by how much? The theoretical framework is used for an empirical study of the link between one public program -- social security -- and private transfers in Peru. Private transfers from young to old would have been twenty percent higher without social security. Also, health coverage from social security reduces private transfers targeted to households affected by illness. However significant, the displacement of private transfers is less than that predicted by models with alruistic motives.

The paper also suggests some directions for future research. This study can be easily replicated for other similar data bases (such as in those countries that are the subject of living standards measurement surveys). Moreover, the scope of the work can be broadened to include the impact of other public subsidies (e.g., education) on private transfers. Also, more work can be undertaken to measure non-monetary private transfers. Finally, the studies focus only on interhousehold transfers. Individual-level data would be required to see what happens intra-household.

II. SOCIAL OBJECTIVES THROUGH PRIVATE TRANSFERS: A REVIEW

This chapter reviews the literature about private transfers with a focus on developing countries. We address the following questions. How large are public transfers? Why do they occur? What are the empirical patterns of private transfers? Can we anticipate how they will react to public policy?

A. The Size of Private Transfers

Table 1 provides a listing of private-transfer information for an assortment of countries. We constructed it from a variety of sources, so transfer definitions are not strictly comparable. But the table points out the importance of private transfers in many countries. For example, among a sample of urban poor in El Salvador, 33 percent reported receiving private transfers, and private transfer income accounted for 38 percent of total income among recipients. Ninety-three percent of a rural south-Indian sample received transfers from other households. In Malaysia, private transfers accounted for almost one-half the income of low-income households. Nearly three-quarters of rural households in Java in Indonesia gave private transfers to other households. And about half of a sample of Filipino households received private cash transfers.

Rempel and Lobdell (1978) surveyed economic and anthropological studies of urban-to-rural remittances covering countries in Asia, Africa and Latin America, and found significant private transfers in virtually all instances. Remittances accounted for significant fractions of income in Tanzania, Nigeria, Ghana, Liberia and Pakistan. Further, private transfers are not strictly a reflection of rural-urban migration. Knowles and Anker (1981), for example, found that over half of all transfers for a sample of Kenyan households did not cross urban-rural boundaries.

Table 2.1. Private Transfers in Selected Countries

Country	Year	Per capita GNP Dollars (1986)	Percent HH's Receiving	Percent HH's Giving	Average Transfer Amount (as percent of income) Receiving	Average Transfer Amount (as percent of income) Giving
El Salvador a/	1976	820				
Urban poor			33	--	11,38 l/	--
India b/	1975-83	290				
Rural households			93	--	8	--
Indonesia (Java) c/	1982	490				
Rural			31	72	10	8
Urban			44	45	20	3
Kenya		300				
Urban d/	1968		--	59	--	3,21 l/
Nairobi e/	1971		--	89	--	21
Nationwide f/	1974		--	27	3	4
Rural			--	19	2	3
Urban			--	62	4	6
Malaysia g/	1977-78	1,830	19/30 m/	33/47 m/	11-46 n/	--
Mexico h/	1982	1,800				
Two villages		--	--	--	16/21	--
Peru i/	1985	1,090	22	23	2,9 l/	1,6 l/
Philippines j/	1978	560	47	--	9	--
USA k/	1979	17,480	15	--	1,6	--

a/ Kaufmann and Lindauer (1986).
b/ Behrman and Deolalikar (1987).
c/ Ravallion and Dearden (1988).
d/ Sample of recent migrants, Rempel and Lobdell (1978).
e/ Sample of poor households, Johnson and Whitelaw (1974).
f/ Knowles and Anker (1981).
g/ Butz and Stan (1982).
h/ Stark, Taylor and Yitzhaki (1988).
i/ Chapter 3, below, in this paper. Average transfer amount computed as proportion of total consumption.
j/ Kaufmann (1982). Cash gifts in a large informal housing area.
k/ Cox (1987). Additional information available in Cox and Raines (1985).
l/ Number after comma denotes amounts among sample of recipients/givers only.
m/ Numbers before and after slash denote upper and lower bounds.
n/ Second number denotes proportion for households in lowest income quintile.

B. Why Private Transfers Are Important

The evidence in table 1 attests to the magnitude of private transfers, but size or frequency is not sufficient reason to pay attention to them. Transfers are only partly determined by custom. Private transfers also respond to social, economic and policy factors. As such they could affect public policy outcomes in unexpected ways.

Consider a hypothetical case of two related households, one young and one old, who pool and share their resources, so that the consumption of individual members is based on aggregate income of the two. Introducing a social security program that taxes the younger household and subsidizes the older one, but leaves aggregated income unchanged, may leave the consumption of the individual household members unchanged as well. The policy might have no effect on the distribution of well-being. Further, if the program involves administrative costs, both households could be made worse off.

Consider a related problem -- evaluating the effectiveness of public health insurance on the distribution of well-being. A simple approach is to subtract appropriately valued health benefits from household income and compare income distributions before and after the substraction. But if the program were really removed private inter-household transfers might fill the gap. A pervasive network of private safety nets could offset changes in public transfers. Put another way, public transfers might be less effective than they look since they could be "crowding out" private ones.

Private transfers can affect calculations of the distribution of income. Suppose a data set contains a variety of income measures but not private-transfer income. Income disparity measures calculated from the data would be biased. Inequality would be exaggerated, for example, if the omitted private transfers flowed from high to low-income households.

Another area where private transfers could figure prominently is that of credit markets. These markets do not work well in many developing countries, partly due to the high cost of obtaining information and trustworthy collateral but also because of government regulation. Private inter-household transfers may act as an informal credit market aimed at overcoming barriers to borrowing. If so, policies designed to increase household access to formal credit markets might prompt reductions in private transfers. Suppose, for example, that government educational loans become available but, as a result, parents decide to reduce their lending to children in school. Private transfers mitigate the policy's impact.

Finally, private transfers could facilitate labor mobility and household migration. Policies aimed at helping workers to respond better to economic incentives, say, by easing rural-urban migration, could simply prompt reductions in private transfers.

C. Motives for Private Transfers

The impact of private transfers on the effectiveness of public policy depends on the motives for private transfers. This section explains how. Why do people make transfers? At least two possible reasons exist. The first is altruism. Adult children, for example, might give to their parents because they care about them and get vicarious satisfaction from giving. Modern analysis of altruism's implications were developed by Becker (1974). Many researchers (for example, Adams (1980); Tomes (1981);

Menchik and David (1983)) have used Becker's model to analyze bequests in the United States. But the altruism model has received less attention in the development literature.

Another conceivable motive for private transfers is self-interested exchange. For example, family members might help with home production or provide other forms of in-kind support in exchange for financial transfers. Such exchange could be contemporaneous or part of a long-term contract. Cash transfers given today might be repaid, in cash or in kind, in future years. Economists have recently begun to apply the exchange idea in a variety of settings, including household production (McElroy and Horney, 1981), private annuity insurance (Kotlikoff and Spivak, 1981) and the exchange of cash for in- kind services (Bernheim, Shleifer and Summers, 1985; Cox, 1987).

Exchange behavior is implicit in many of the analyses of family behavior in the development literature. In their survey of the migrant remittance literature, Rempel and Lobdell (1978) conclude that "Remittances should be seen as reflecting primarily the self-interest of the migrant." (p.336) They suggest that remittances might aptly be interpreted as repayments for migration assistance or as insurance premiums against income shortfalls. Rosenzweig and Wolpin (1985) explain family-farm dynasties as the outcome of intergenerational contracts that maximize gains from knowledge about farm characteristics. Kaufmann and Lindauer (1986) view private transfers as the outcome of an implicit social insurance contract among a network of related households, with transfers to temporarily disadvantaged households acting as insurance payments.

Lucas and Stark (1985) eschew the strict altruism/exchange dichotomy in favor of an eclectic approach that recognizes each motive as "tempered altruism or enlightened self-interest." (p. 901) Family members

enter into insurance contracts to protect against individual income shortfalls, and mutual altruism helps enforce the contracts. But Cox and Jakubson (1989) show that often, even if transfers are influenced by both motives, in a given instance only one will predominate.

The main reason transfer motives are important is that they determine the outcomes of public income redistribution. The altruism model predicts that public transfer programs have little effect on the distribution of economic well-being. With altruism, changes in public transfers are simply offset by corresponding changes in private ones.

To see why this occurs, consider the main premise of the altruism model. The donor gives in order to experience indirectly the increased well-being of the recipient. The donor calculates total pre-transfer income and, based on his/her feelings of altruism toward the dependent, determines how much they both will consume by making a private transfer.

Now suppose that a public transfer program taxes the donor and gives the proceeds to the dependent. Combined income of the spending-unit (defined as donor plus dependent) has not changed and neither, presumably, has the donor's attitude toward the dependent. So the donor's calculation of optimal consumption for both donor and dependent will not change. The only thing that has changed is individual, pre-private transfer incomes. The donor need not make as large a private transfer to attain desired consumption for the dependent. The impact transfers of the public transfer program is completely offset by changes in private transfers.

Of course, not all public transfer programs leave aggregate income of the spending-unit unchanged. Further, a public transfer program might give the dependent more than he or she would have received privately. Also, many households neither give nor receive private transfers and in these instances there are, of course, no private transfers to be displaced

private transfers that occur with altruism. Still, the altruism model predicts that, if altruistic private transfers occur, they diminish the effects of public income redistribution.

In an extremely influential article, Barro (1974) uses an altruistic framework to show how private transfers can undo the forced intergenerational transfers associated with deficit spending and Social Security. His analysis predicts that, with operative private transfers, the national debt will not hurt future generations because older ones will leave higher bequests, so that deficits matter little for either generation. A similar argument applies to social security. Public transfers from young to old merely reduce private ones. Again, altruism is necessary for these results.

Exchange-motivated transfers can interact with public transfers in an entirely different way. In fact, they can actually exacerbate, rather than offset, the effects of changes in public redistribution on the well-being of private transfer recipients.

To illustrate, consider the following contrived but illuminating example. Suppose a donor makes private transfers in exchange for in-kind services rendered to him by the recipient (for example, home production). For every hour of the recipient's work at home, the donor pays the recipient at the hourly market wage rate. Now consider the effects of taxing the donor and subsidizing the recipient's wage. The first order effect of this scheme is the same as with two unrelated individuals: that is, the donor is made worse off and the recipient better off. But a second round effect occurs. The donor must pay higher compensation for the services of the recipient (who, as a result of the subsidy, does not value the donor's help as much as before). This detracts further from the donor's well-being, and adds more to that of the recipient. This

"amplification" outcome is exactly the opposite of that predicted by the altruism model.

Knowing the motives behind a private transfer is essential for understanding the connection between public and private transfers. The connection is important since nearly all public policies, including those that focus on the economy's general performance, redistribute income from one group to another. A large fiscal deficit, for example, shifts income from future generations to the current one. The motives for private transfers determine the effects of deficits on the relative well-being of generations.

D. Empirical Evidence on Private Transfers

Empirical patterns for private transfers indicate a variety of functions and effects: they narrow income inequality, function as social insurance, ease borrowing constraints; contribute to human capital investment in schooling and migration; and interact with public transfers.

Evidence on transfer motives is mixed. Some patterns indicate altruism, others exchange, and some could be generated by either motive. We assess the evidence in the light of transfer motives.

1. Transfers and Inequality

Private transfers tend to equalize the distribution of income, especially by boosting the incomes of the poorest households. For example, private transfers increase bottom-quintile incomes of urban households in Kenya by 90 percent (Knowles and Anker, 1981). Private transfers raise the bottom quintile's share of aggregate consumption by 14 percent in Peru (see Chapter 3, below, in this paper). And they have a substantial equalizing effect on incomes in two Mexican villages analyzed by Stark, Taylor and Yitzhaki (1986). Private transfers also lower the variance in log-income in the United States (Cox and Raines, 1985).

At face value, the equalizing effect of private transfers suggests altruism, and the pattern of rich giving to poor is certainly consistent with this motive. But a closer look at transfer patterns indicates that altruism may not predominate. In fact, some transfer patterns run counter to altruism, and are more consistent with exchange.

There are two reasons to question the altruistic motive for transfers. First, the pattern of rich giving to poor is also consistent with exchange. Suppose, for example, that financial transfers purchase in-kind services. If the demand for services is income elastic and the supply price of services is inversely related to income, a pattern of rich giving to poor emerges (Cox, 1987).

The second reason to question the altruistic motive comes from a closer look at transfer patterns. Higher income households do give more transfers (Johnson and Whitelaw, 1974, Knowles and Anker, 1981 (Kenya); Ravallion and Dedarden, 1988 (rural households in Java); and lower-income households are more likely to receive them (see Chapter 2 for Peru); Cox, 1987 (U.S.)). However, these patterns alone are not a discriminating test for transfer motives, since they are also consistent with exchange.

A better test comes from the relationship between the recipient's pre- transfer income and the transfer amounts received. The two theories, altruism and exchange, can part ways when it comes to this relationship. The altruism model predicts that it is always negative. A shortfall in the recipient's resources, for example, always prompts more generous transfers. But the exchange model admits a positive relationship between the two variables. Higher income strengthens the bargaining position of recipients

in exchange, so that when their income increases, they can get higher transfers.

The empirical evidence on this crucial relationship is mixed. Some studies find an inverse relationship between recipient resources and transfer amounts received, such as Lindauer and Kaufmann, 1986 (El Salvador); Kaufmann, 1982 (Philippines), Ravallion and Dearden, 1988 (rural households, Java) and Tomes, 1981 (U.S., bequests). But others find a positive relationship, which contradicts the altruist hypothesis, namely Lucas and Stark, 1985 (Botswana); Cox, 1987 (U.S.); Ravallion and Dearden, 1988 (urban households, Java) and Chapter 2 (Peru). Since the latter findings cast doubt on altruism, they also cast doubt on the Barro-Becker hypothesis that public transfers merely crowd out private ones.

2. Transfers as Social Insurance

Private transfers can insure against the illness, disability, unemployment and old-age related reductions in earning potential. This insurance function may be particularly important when publicly provided social security programs are inaccessible, as is the case in many developing countries. What is the evidence?

Old age support. Although many developing countries have public pensions, most of these apply only to urban workers in the formal sector. So, except for some urbanized countries (mostly Latin American), coverage is limited. And the problem is compounded by underdeveloped financial markets which lower the returns from saving for retirement (World Bank, 1989). Older generations have to rely on the young for income support.

Transfer patterns are consistent with the notion that transfers provide old age support. Over a quarter of private transfers in Kenyan and Peruvian samples were given to parents from children (Knowles and Anker, 1981; Chapter 3, below). Butz and Stan (1982) and Ravallion and Dearden (1988) found significant transfers from young to old in Malaysia and Java

respectively. And, in Peru, over a third of the elderly (aged 61 and over) received transfers--more than twice the comparable figure for those aged 41-50 (Chapter 4, below). As earnings decline late in life, the probability of receiving a private transfer dramatically increases.

Indeed, some argue that, in developing countries, old age support is the main reason for having children. Nugent's (1985) recent review of the literature on old age support and fertility documents much controversy, but most evidence indicates fertility decisions are at least partly motivated by a desire to insure against the uncertainties associated with old age. And old age support from children includes time-intensive care in addition to money (see Butz and Stan, 1982).

These findings support a private-pension transfer motive but they are inconclusive because the patterns could be generated solely by inadequate capital markets.

Disability, illness and unemployment. Some empirical evidence suggests that private transfers mitigate the effects of being disabled, ill or unemployed. In Peru, households reporting illness four weeks prior to the survey were more likely to receive private transfers. And transfers apparently respond to the availability of publicly-subsidized medical care. In Indonesia, donors assist the sick and those with recent births in rural areas but not in urban ones, where access to public health clinics is greater (Ravallion and Dearden, 1988). High-quality public health coverage also weakens the connection between private transfers and illness in Peru (Chapter 4, below).

Despite their greater frequency, transfer amounts targeted to the ill in Peru are lower than those received by their healthy counterparts. Exchange is a possible explanation. Illness would limit the quality of in-

kind services household heads provide for others, which would reduce exchange related transfers.

Unemployed households have a greater probability of receiving transfers and received greater amounts. In Peru and in Indonesia, being unemployed significantly increases the probability of receiving a transfer, as well as the amount of the transfer (Chapter 3, below; Ravallion and Dearden 1988).

Female-headed households. A consistent pattern across countries is that females or female headed households have a higher probability of obtaining transfers and of receiving larger amounts than their male counterparts (Salvadorean households in Kaufmann and Lindauer 1986; Botswana individuals in Lucas and Stark 1985; Peruvian households in Chapter 3, below; American households in Cox 1987). The effect persists even after holding constant for current income. Why?

One reason is purely technical. Females tend to live longer than males and they may get more transfers due to the old age motives already discussed above.

Another reason may be that private transfers compensate females for discrimination in the formal labor market. Even though the female effect is strong even with current income held constant, the transfers may reflect past discrimination. Also, if discrimination holds females back from the formal labor market, they may engage in other activities that entail transfers but are, in reality, compensation for services rendered -- such as child rearing or fosterage (Ainsworth 1989).

3. Migration and Education

Another connection between private transfers and risk, analyzed extensively by Lucas and Stark (1985), is migration. Households can minimize risk by diversifying their "portfolio" of jobs. A rural family,

for example, might send a family member to the urban formal sector to insure against income shortfalls from poor harvests. Lucas and Stark find migrant remittances are targeted to farms with more risky (for example, drought sensitive) assets.

Migration does more than mitigate risk, however. Like education and training, it is an investment in human capital. Human capital investment is most profitable when done early, so that enhanced skills can be used over a long time span. But borrowing constraints are likely to be most severe in the early stages of life. Private transfers can facilitate investment in skills by helping overcome such constraints.

Empirical transfer patterns support the idea that private transfers are connected to human capital investment. In Peru, for example, the incidence of transfer receipts among the young (aged 15-30) is twice that of the middle-aged (41-50)--28 versus 15 percent (Chapter 4, below). And those with more advanced schooling receive much higher amounts than those with only a primary education.

Further, private transfers appear strongly responsive to liquidity constraints. In Peru, transfer incidence mirrors exactly the age earnings profile: the chances of receiving a transfer are lowest when earnings peak. And evidence from the United States supports the idea that transfers are targeted to people who face borrowing constraints (Cox (forthcoming), Cox and Jappelli (1989)).

E. Public Policy and Private Transfers

The few available studies suggest a strong connection between private and public transfers. Chapter 4 find that private transfers from young to old in Peru would have been 20 percent higher without Social Security pension benefits. Peruvian social security health benefits dampen private transfers as well. Cox and Jakubson (1989), find that private

transfers would have been 14 percent higher in the United States without public income transfer programs.

These estimates are lower than the complete "crowding out" predicted by Barro and Becker, but seem large enough to warrant interest among policy makers. They are particularly important for developing countries where tight budgetary constraints and adverse macroeconomic conditions have forced made governments to look for more efficient means of undertaking social programs. Unfortunately, the relationship between public and private transfers in developing countries has received very little attention. It is an important area for future research.

F. Conclusions

Private transfers in developing countries are widespread and responsive to social and economic conditions, but evidence on their motives is mixed. Economic theory suggests that private transfers should also respond to public policy, and initial empirical work shows that they do.

Empirical private transfer patterns, such as the following, indicate that they may be an important component of social and economic policy design:

- Private transfers equalize income;
- Private transfers are directed toward the poor, the young, the old, women, the infirm, and the unemployed; and
- Public tax and subsidy programs can affect private-transfer behavior.

The policy implications are important; when private behavior adjusts, there may be unforeseen or unintended implications for public transfer programs, in terms of who benefits and by how much. Additional research is needed to complement and substantiate the few available studies if these private adjustments are to be used to make public policy more effective and efficient.

III. WHO GIVES AND WHO GETS PRIVATE INTER-HOUSEHOLD TRANSFERS IN PERU?

High quality data on private transfers are scarce. Researchers must often draw inferences from small samples and idiosyncratic case studies. Even in large surveys, key variables like health status and unemployment are often lacking. And no survey to date has gathered extensive information for both public and private transfers.

The World Bank's Peruvian Living Standards Survey (PLSS) remedies many of these deficiencies. The survey covers a large nationwide sample of households. It contains extensive information on the economic situation of survey respondents, permitting the identification of vulnerable groups such as the ill, the unemployed, the under-insured and the poor. So we can measure how much more is given privately to those in economic distress. Also the PLSS contains high-quality consumption data. We can accurately gauge the impact of private transfers on the distribution of economic well-being.

This chapter is organized as follows. First, we describe the PLSS. Next we look at the impact of private transfers on the distribution of household consumption, and at the insurance function of transfers. We then explore rural/urban differences in private transfers. Finally, we look at the connection between public and private transfers.

Findings from the PLSS indicate that private transfers play a key role in the economic life of households. Transfers follow a pronounced life-cycle pattern and vary according to education. They are targeted toward the ill, the unemployed and women. The most novel finding from the PLSS is that public policy appears to affect private transfer behavior. Transfers vary depending on whether households are covered by Social Security. This finding could have implications for policy design.

A. Data

PLSS was conducted by the World Bank in conjunction with the Peruvian Instituto Nacional de Estadistica (INE). The PLSS gathered socioeconomic information for a sample of 5,109 households, comprising about 27,000 persons. Field work took place between June 1985 and July 1986.

The household is the unit of observation for our analysis. We deleted those with missing data for any of the following: private transfers, age, education of household head, parental schooling, illness, household size, gender of household head, consumption and urban/rural residence. The selection rule reduced the original sample of 5,109 to 4,184.

The questions on transfers to other households given are contained in section 11, part E of the PLSS. Respondents were asked: "Has any member of your household sent money or goods--regularly or irregularly--to persons who are not members of your household during the last 3 months?" They reported the recipient's relationship to households head (for example, son, parent) and residence (for example, country-side, city). Respondents reported the value, in intis (in 1986, US$1 = 14 intis), of cash and in-kind transfers given in the past three months. The same questions were asked for inter-household transfers received (Section 13, Part B).

Of the 4,184 households in our sample, 1,216 reported giving a private transfer to another household and 1,144 reported receiving one. Four hundred and forty six reported both giving and receiving. Information on the incidence of private transfers is given below.

	Number	Percentage of Sample (N = 4,184)
Households Giving	1,216	29.06
Households Receiving	1,144	27.34
Households Both Giving and Receiving	446	10.66
Households Neither Giving Nor Receiving	2,270	54.25

Because some households both gave and received, we focus on net receipts (in other words, transfers received minus given) and net donations (transfers given minus received) in what follows. A household is a net transfer recipient if gross transfers exceed those given, and a net transfer donor if the opposite is true. The breakdown of households by net transfer status is given below:

	Number	Percentage of Sample (N = 4,184)
Net Transfer Donors	978	23.37
Net Transfer Recipients	905	21.63
Net Transfer Equals Zero ("Others")	2,301	55.00

Because 446 households both gave and received, some givers are "net recipients" and vice versa. For simplicity, we refer to net transfer recipients as "recipients" and net transfer donors as "donors" or "givers." Further, 31 households both gave and received the exact same amount. So the "others" category in the table above contains 2,301 households, even through 2,270 neither gave nor received private transfers.

Households reported sources and destinations of transfers by relation. The following is an account of sources of transfers received.

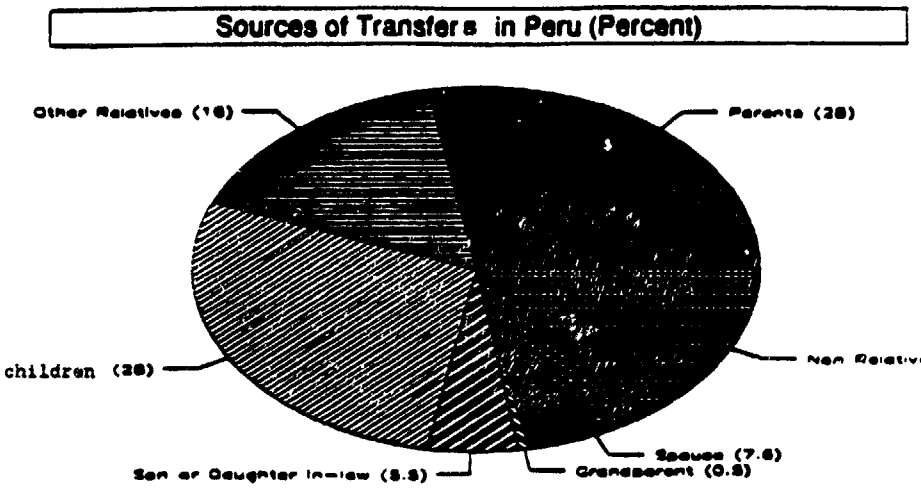
	Number of Transfers	Percentage of Transfers	Percentage of Intis Transferred
1. Parents	281	24.4	28.0
2. Other Relatives	279	24.3	16.0
3. Children	431	37.5	28.3
4. Son or Daughter-in-Law	26	2.3	5.5
5. Grandchildren	11	1.0	0.5
6. Spouse	38	3.3	7.6
7. Non-relative	84	7.3	14.2
TOTAL	1,150	100.0	100.0

The majority of transfers flow between parents and children, though other relatives account for a quarter of the total. But the latter give smaller amounts; their share of transfer amounts is 16 percent (Figure 3.1). In-laws, grandchildren, spouses and non-relatives comprise only a small fraction of transfer sources. Since we are looking at inter-household transfers, spouses account for a negligible proportion of transfers. For such a transfer to occur, spouses would have to reside in separate households, which is rare.

B. Transfers and the Distribution of Welfare

Peruvian patterns corroborate the evidence for other developing countries that private transfers have an equalizing effect on the distribution of economic status and well-being. While household income is commonly used as a welfare indicator, reliable non-wage income was not readily available in the data base. Instead, we follow other analysts who have used consumption, which can be interpreted as a proxy for permanent income. (See Glewwe (1988) and Glewwe and van der Gaag (1988) for a similar justification.)

Figure 3.1


Sources of Transfers in Peru (Percent)
Other Relatives (16)
Parents (28)
children (28)
Non Relative
Spouse (7.6)
Grandparent (0.8)
Son or Daughter in-law (5.8)

To put the figures in perspective, consider the average transfer amount as a fraction of consumption. The average transfer received, for the entire sample, was 34.48 intis per month, which accounted for 1.6 percent of average monthly consumption. (All inti values in this paper are reported on a monthly basis.) The average transfer among recipients was 159.41 intis, which accounted for 8.5 percent of consumption for the sub-sample.

A second way to assess the size of private transfers is to compare them with public transfers from social security. Social security retirement benefits over the three-month period were 17.80 intis. Private transfers are twice as large as Social Security retirement transfers--34.48 versus 17.80.

Private transfers have a more pronounced effect on the distribution of economic well-being than social security. Table 3.1 shows how each type of transfer affects the distribution of consumption. The second column shows the distribution with all transfers removed. In other words, this measure is actual consumption minus private and public transfers received, plus private transfers given, plus social security tax payments. Column 3 shows the effects of private transfer receipts and donations on the distribution of consumption. Column 5 of the table shows the effects of public transfers on the distribution; social-security income is added and tax payments subtracted. Column 7 contains the actual distribution of consumption (in other words, with both private and public transfers).

Table 3.1. Effects of Public and Private Transfers on the Distribution of Well-Being

Share of Aggregate Consumption (Percentage)

(1) Consumption Quintile	(2) Before Transfers	(3) After Private Transfers	(4) Percentage Change from (1)	(5) After Public Transfers	(6) Percentage Change from (1)	(7) Private & Public Transfers	(8) After both Percentage Change from (1)
Lowest (694 & below)	4.085	4.643	(+13.66)	4.241	(+3.82)	4.798	(+17.45)
Fourth (695-1,192)	8.768	8.875	(+1.22)	8.785	(+0.19)	8.982	(+1.41)
Third (1,193-1,795)	13.814	13.83	(+0.15)	13.839	(0.18)	13.859	(+0.33)
Second (1,176-2,910)	21.184	21.075	(-0.51)	21.198	(+0.07)	21.089	(-0.45)
Highest (2,911 & above)	52.189	51.610	(-1.12)	51.975	(-0.41)	51.398	(-1.52)

Before private transfers, the lowest quintile's share of aggregate consumption is 4.085 percent. After private transfers, the share increases to 4.643--a boost of 13.66 percent. In contrast, public transfers alone increase the lowest quintile's share of consumption to only 4.241--an increase of 3.82 percent. The same pattern occurs for the next-to-lowest (fourth) quintile-- private transfers have a greater impact on consumption shares. Public transfers actually raise the second quintile's share a bit, while private transfers reduce it. Private transfers reduce the highest quintile's consumption share more than public ones do.

Much of the variation in total consumption can be explained by educational levels. The human capital framework emphasizes the role of education in enhancing income and, thus, consumption. So it is not surprising to find that private transfers vary by educational attainment in a pattern similar to that described above (see the table below and Figure 3.2).

	Number	Percentage Receiving	Average Amount(Intis)	Average Amount Among Recipients(Intis)
No School	674	24.8	15.08	64.50
Initial of Primary	2,067	20.1	19.23	95.53
Secondary	840	23.5	61.27	261.23
Technical	142	18.3	43.70	238.70
Post-Secondary	111	21.6	45.77	211.67
University	350	21.4	88.59	413.43

The incidence of private transfers does not follow a distinct pattern across educational categories, but amounts do tend to increase with education. Average transfers for recipients with no schooling are only 64.50 intis; their university educated counterparts get 413.53 intis. Part of the education effect is likely to be due to differences in donor incomes. University graduates are more likely to be linked to high-income donors than are those with only primary schooling.

Transfers given are positively related to educational attainment:

	Number	Percentage Giving	Average Amount(Intis)	Average Amount Among Givers(Intis)
No School	675	10.5	14.07	133.57
Initial or Primary	2,067	22.1	28.01	126.69
Secondary	840	28.5	40.69	143.00
Technical	142	33.1	48.83	147.53
Post-Secondary	111	40.5	206.61	509.38
University	350	34.0	75.99	223.52

Figure 3.2a

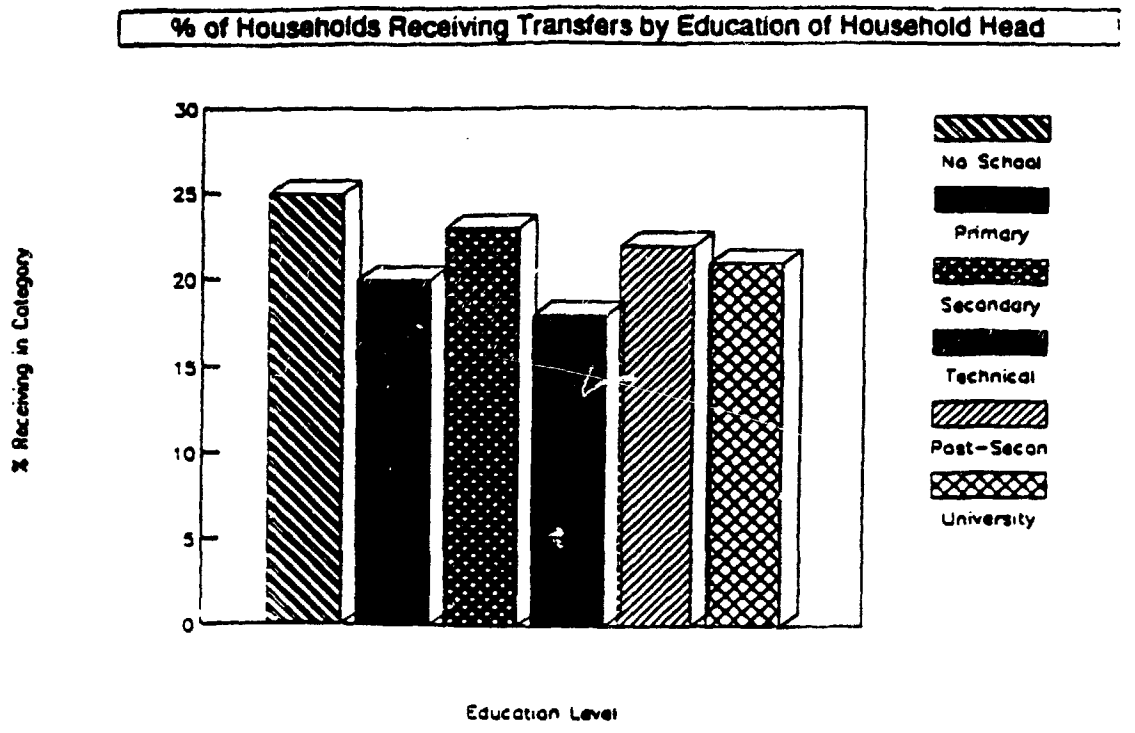
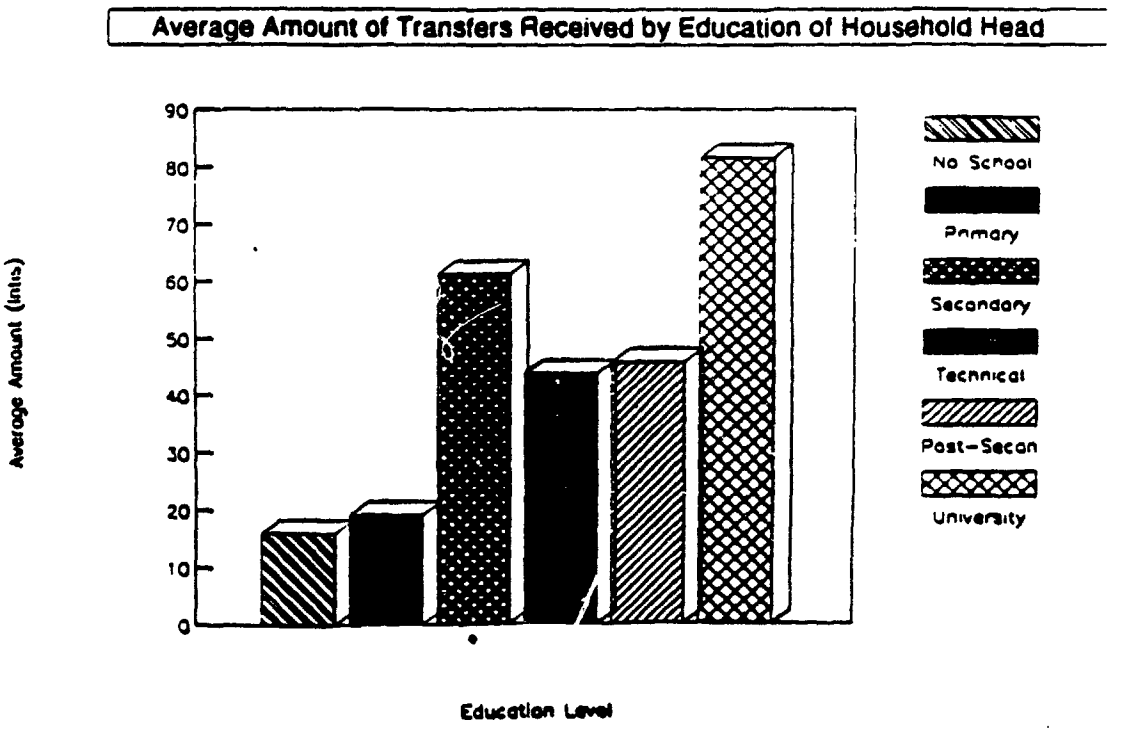


Figure 3.2b



C. Transfers as Social Insurance

Private transfers tend to be given to those with fewer economic resources, as indicated below.

	Number	Percentage Receiving	Average Amount(Intis)	Average Amount Among Recipients(Intis)
< Median Consumption	2,092	23.7	17.64	74.38
> Median Consumption	2,092	19.5	51.30	262.53

About 24 percent of households with less than medium consumption received transfers, compared to about 20 percent of those with greater than median consumption. But recipients in the group with higher consumption got bigger amounts--262.53 intis versus 74.38.

The economically disadvantaged, measured either by consumption or unemployment, do not give as much as the more fortunate. The patterns are depicted below.

	Number	Percentage Giving	Average Amount(Intis)	Average Amount Among Recipients(Intis)
< Median Consumption	2,092	15.8	16.61	105.23
> Median Consumption	2,092	31.0	58.90	190.26
Unemployed	1,170	15.8	15.20	96.15
Not Unemployed	3,014	26.3	46.52	176.83

Other studies came to the same conclusion -- that private transfers are targeted towards the poor. In Kenya, urban households in middle income groups gave the largest fractions of their income and the

lowest income groups received the most (Knowles and Anker, 1981). In Mexico, remittances from the U.S. have a profound equalizing effect on migrants' home villages, although remittances from internal migrants embody a large returns-to-schooling component (Stark, et. al, 1986). Ravaillon and Dearden (1988) find that transfers reduce income inequality in rural areas (and in urban ones too, but only slightly).

Kaufmann and Lindauer (1986) advance a stronger version of the targeting pattern; social networks direct transfer payments to those families with incomes below a "basic needs" level. They conclude that "the performance of the income variables seems to support the view that progressive distributional outcomes are being realized." (p.349)

In addition to compensating directly for income, transfers also appear to act as social insurance for unemployment, old age and disability. Age is one of the most important variables affecting transfer receipts. Receipts are highest for the young and the old and least for the middle-aged. Figure 3.3 shows this U-shaped pattern. The figure suggests that private transfers function in part as an informal credit system for households, in other words, a substitute for banks and credit unions. Access to credit markets is limited for many Peruvian households. They probably turn to relatives and friends for funds early in the life-cycle when income is lowest. The high incidence of transfers for older households could be repayments for past loans. Or they could be altruistically motivated transfers, spurred by the desire to boost resources for those whose incomes have fallen.

Figure 3.3a

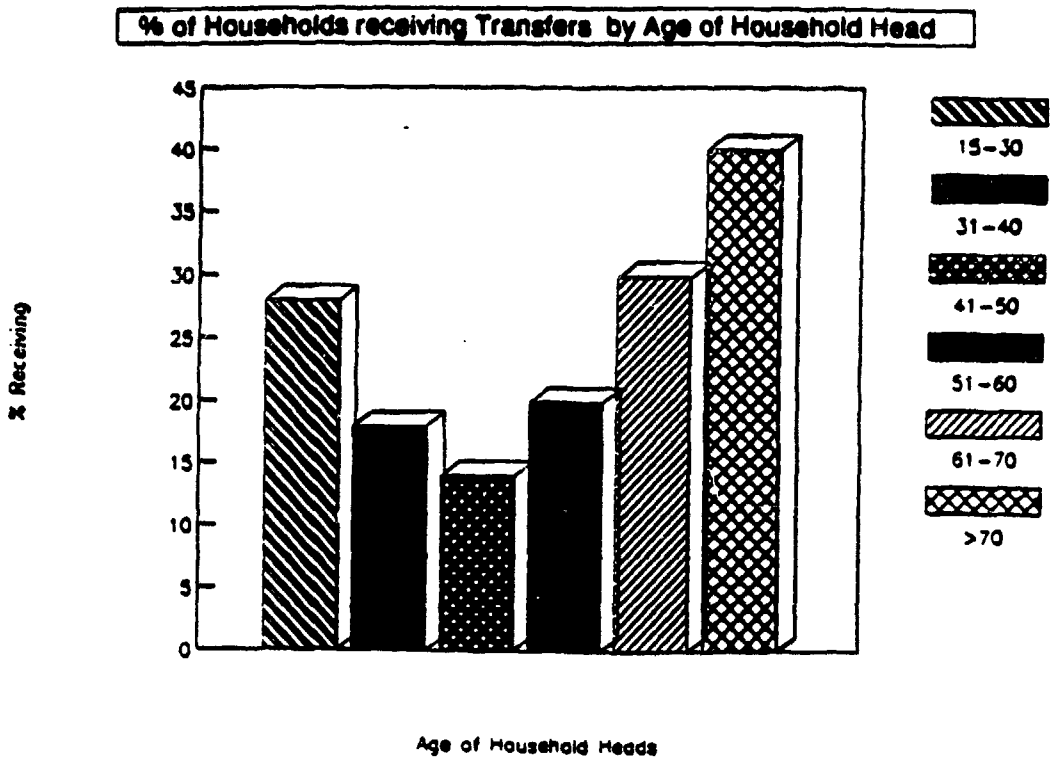
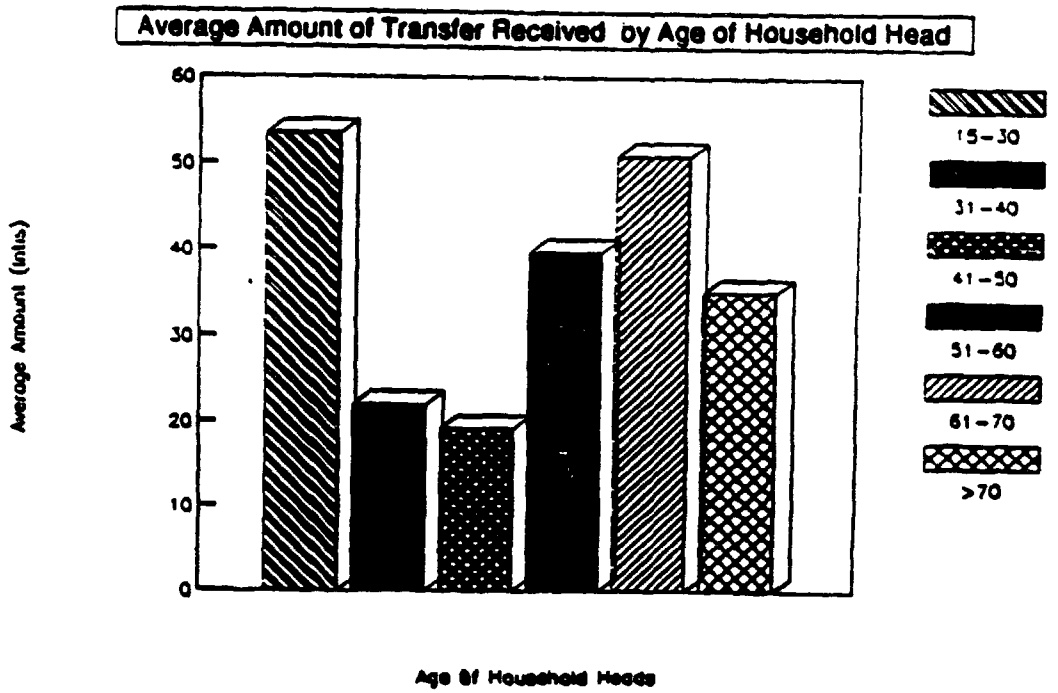


Figure 3.3b



	Number	Percentage Receiving Transfers	Average Transfer Amount(Intis)	Average Transfer Amount Among Recipients(Intis)
Age 15-30	443	27.5	53.38	193.82
Age 31-40	936	17.6	21.87	124.06
Age 41-50	926	14.5	19.11	132.08
Age 51-60	727	19.7	39.64	201.55
Age 61-70	482	30.1	50.88	169.12
Age 70 and over	309	40.5	35.02	86.56

The age pattern for giving is the exact opposite of the one for receipts.

	Number	Percentage Giving Transfers	Average Transfer Amount(Intis)	Average Transfer Amount Among Donors
Age 15-30	443	19.9	19.92	100.28
Age 31-40	936	25.5	29.59	115.90
Age 41-50	926	26.3	38.60	146.51
Age 51-60	727	28.2	56.92	201.87
Age 61-70	482	17.4	58.41	335.15
Age 70 and Over	309	13.3	15.14	114.10

The proportion giving first rises then falls with age. But the average amount for givers, however, steadily rises for all but the highest age category.

Ravaillon and Dearden (1988) also find that transfers are targeted to the elderly in rural areas and to both young and old in urban areas of Java, Indonesia These age patterns suggest that transfers smooth consumption for the liquidity-constrained. Behrman and Deolalikar (1987) also find evidence for the income-smoothing hypothesis.

Another prominent pattern is differences in receipts by gender; female-headed households receive more.

	Number	Percentage Receiving	Average Amount(Intis)	Average Amount Among Recipients(Intis)
Males	3,618	8.3	26.65	145.56
Females	666	39.2	75.87	193.59

Incidence and size of receipts are higher for female-headed households. There are three possible reasons for this pattern. First, women tend to be poorer so transfers might be compensating for income deficiencies. Second, these transfers might represent payments for in-kind services provided to other households. If women are frequently involved in inter-household services (for example, childcare), they might receive more private transfers. Third, part of the gender effect may reflect male-female differences in life expectancy. A lot of private giving goes to the elderly, and women live longer than men. So private transfers may be given to widows.

A much higher proportion of male-headed households give transfers than female-headed ones. Gender differences in giving are summarized below.

	Number	Percentage Giving Transfers	Average Transfer Amount(Intis)	Average Transfer Amount Among Giving(Intis)
Males	3,618	25.2	41.94	166.32
Females	666	13.7	15.74	115.21

The average transfer among female givers is also markedly lower than that among males. So the gender pattern for giving is the opposite of that for receipts.

The gender differences above are consistent with those found for Botswana (Lucas and Stark, 1985) and El Salvador (Kaufmann and Lindauer, 1986). In those countries, female-headed households have a higher probability of obtaining transfers and they receive larger amounts. Similar evidence has been found for the United States (Cox, 1987).

Private transfers appear to respond to economic distress (see below).

	Number	Percentage Receiving	Average Amount(Intis)	Average Amount Among Recipients(Intis)
Ill	2,164	24.4	32.70	33.76
Not Ill	2,020	18.6	36.39	195.50
Unemployed	1,170	32.6	60.77	186.12
Not Unemployed	3,014	17.4	24.28	139.91

A greater percentage of those reporting illness (of either head or spouse) four weeks prior to the survey received transfers. But the average amount among recipients was higher for those not ill. A greater fraction of households unemployed 12 months prior to the survey received transfers. The average amount for recipients was higher for the unemployed as well. These patterns suggest transfers function in part as private insurance.

The proportion of givers does not vary with illness, which is surprising.

	Number	Percentage Giving Transfers	Average Transfer Amount(Intis)	Average Transfer Amount Among Givers(Intis)
Ill	2,164	23.5	36.06	153.60
Not Ill	2,020	23.3	39.60	10.18

Further, amounts given are slightly higher for those not ill. A possible explanation is that those prone to illness, due to, say, limited access to good water supplies, might form informal private insurance schemes with similar households. This behavior would boost the incidence of both donations and receipts among the ill.

D. Transfers, Rural/Urban Differences and Migration

Receipts are much higher for urban households than rural ones. The patterns are listed below. Incidence of receipts is higher for urban households as well.

	Number	Percentage Receiving	Average Amount(Intis)	Average Amount Among Recipients(Intis)
Urban	2,241	25.3	57.51	226.89
Rural	1,943	17.3	17.92	45.68

Urban-rural differences in donations mirror those for receipts. Transfers given by urban households were more frequent and larger.

	Number	Percentage Giving	Average Amount(Intis)	Average Transfers Amount Among Givers(Intis)
Urban	2,241	27.0	49.02	181.27
Rural	1,943	19.1	24.79	129.47

Survey respondents reported the sources and destinations of transfers according to place -- countryside, village, town and city. So we can trace urban-rural patterns in transfers. We used the following convention -- the categories "village", "town" and "city" as urban places and "countryside" as rural. The patterns are depicted below.

	Number of Transfers	Percentage of Total Transfers	Percentage of Total Amount Transferred
Urban to Rural	711	32.54	37.86
Rural to Urban	645	29.52	11.44
Urban to Urban	351	16.06	13.44
Rural to Rural	478	21.88	37.26
TOTAL	2,185	100.00	100.00

Many transfers cross urban-rural boundaries, but a significant minority (38 percent) occur between households that reside in the same place (see Figure 3.4).

What about the evidence in other developing countries? As in Peru, in Indonesia the percent of households receiving transfers is higher in urban than in rural areas. But the percentage of households giving is higher in rural areas there. Average receipts are also much higher in urban than in rural areas (Ravaillon and Dearden 1988). Much of this may be caused by urban-rural income differences.

Figure 3.4a

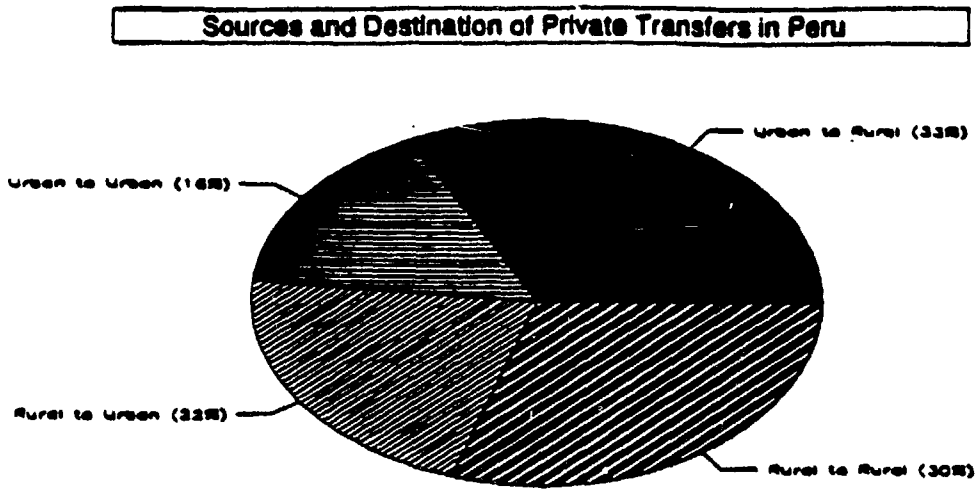
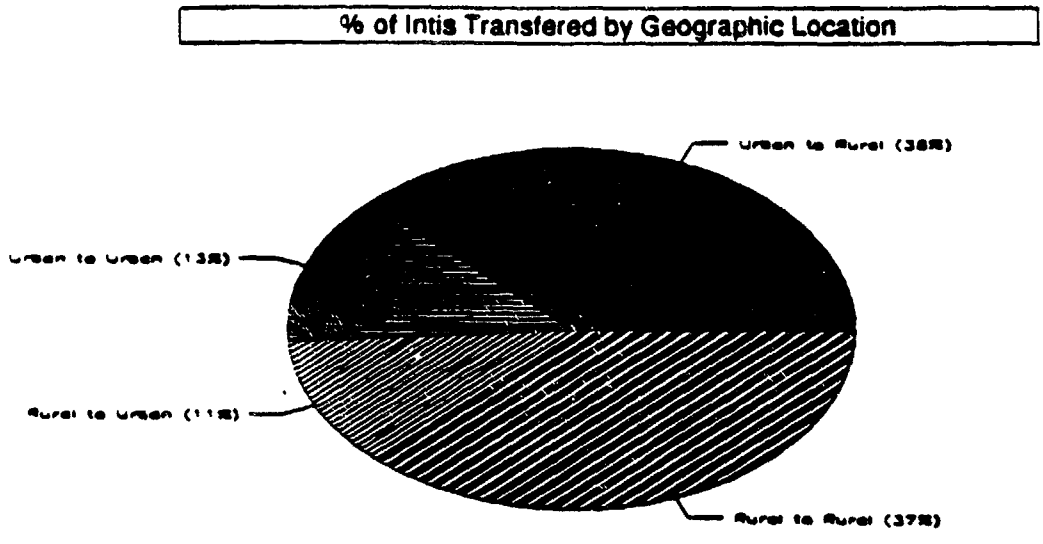


Figure 3.4b



A significant proportion of transfers cross rural-urban boundaries. Part of the pattern is likely to be due to implicit contracts among migrants and stayers. Lucas and Stark (1985) argue that in Botswana, "to allocate certain members as migrants may be a Pareto-superior strategy, and remittances are the mechanism for redistributing the gains." (p. 914) Transfers help spread the risk of migration, and help parents to invest in the education of youngsters, who migrate to town, to reap returns and to repay the initial outlay. Similarly, Knowles and Anker (1981) conclude that, in Kenya, "migrants are under a strong obligation to send transfers back to their home area but that this obligation weakens significantly the longer they reside away." (p. 217) These results corroborate evidence gathered from international remittance behavior in Mexico (see Stark et al. 1986).

E. Public and Private Transfers

Private transfer patterns differ depending on whether households participate in social security. Two examples are given below. First, consider the sample of urban households aged 60 or over.

	Number (Age 60+)	Percentage Receiving	Average Amount(Intis)	Average Amount Among Recipients(Intis)
Receiving Social Security	112	25.9	84.33	325.69
Not Receiving Social Security	276	40.9	74.09	180.96

A much higher proportion of those without Social Security pensions got private transfers than those with Social Security. A possible reason is that social security "crowds out" private giving. Children whose parents

are provided for by public transfers have less incentive to contribute to their well-being. But note also that private transfer recipients who also received social security retirement income also received higher amounts, on average, than their counterparts not receiving social security. A possible explanation is that those in the social security system tend to be high-income households with linkages to high-income children.

The social security system provides health insurance coverage in addition to retirement benefits. And private transfers to households that are ill differ depending on social security coverage. This pattern, for the sample of urban households, is depicted below.

	Number	Percentage Receiving Transfers	Average Transfer Amount(Intis)	Average Transfer Amount Among Recipients(Intis)
Ill & Covered by Social Security	457	24.7	50.29	203.40
Ill & Not Covered by Social Security	679	33.3	58.16	174.74

Transfer incidence is higher for urban households with members who are ill but not covered by social security. Apparently, eligibility for public health benefits "crowds out" private giving targeted toward those who are ill.

The last two tables suggest an interaction between public and private transfers which we will scrutinize further in later research.

F. Conclusions

As in many other countries, private inter-household transfers in Peru are pervasive. Forty five percent of households are either donors or recipients. Transfer patterns indicate that they may be important in designing social policy.

- Private transfers tend to equalize income.
- Aside from the poor, private transfers tend to be directed towards other vulnerable groups such as the young, the old, the infirm and women.
- The impact of relevant policy change, such as tax reform, on private transfers should thus be monitored.
- Public subsidies may displace private transfer behavior.

IV. MOTIVES FOR PRIVATE INTERGENERATIONAL TRANSFERS: AN ANALYTICAL FRAMEWORK AND PRELIMINARY EVIDENCE FROM PERU

There are two competing hypotheses that explain transfer giving. One is that households give to satisfy altruistic feelings. The other is that households give because they expect something in exchange. These two motives imply different outcomes for public policies that redistribute income. For example, Barro (1974) shows that altruistic households could completely neutralize the forced inter-generational transfer associated with government borrowing by adjusting their own private transfers. Changes in private inter-generational transfers could likewise undo public social security transfers, education and health subsidies and other welfare programs if households are altruistic. If households are motivated by exchange, these results do not necessarily hold.

Yet rigorous tests of the motives for private transfers are only beginning to be undertaken. This is partly due to a dearth of quality data, even in the U.S. (Cox, 1987). There are almost none in developing countries (see Chapter 2, above, in this paper).

This chapter fills this gap with a case study of Peru. One contribution is that it develops a rigorous test based on a model that is particularly apt for developing countries -- that of households that are liquidity constrained. Thus, it adopts an inter-generational approach, presented in Section A, whereby transfer behavior reflects that

institutional constraint. Another contribution is the use of a detailed data base, described in Section B, that contains information about income, transfers and access to publicly provided services. Such data are uncommon in many countries. Finally, the paper uses the data and the model to conclude that exchange is a stronger motive for giving in Peru than altruism (Section C). The policy implications of these results are discussed in Section D.

A. Theory

The relationship between private transfers and income can test the altruism and exchange motives for giving. To show this, we present a model based on utility maximization by households (or heads of households). In order to capture the impact of liquidity constraints on inter-generational transfers, the model is one of overlapping generations and works as follows.

The life-cycle of an individual consists of four periods: two "child" periods and two "parent" periods. During the child phase, the individual has a parent but no children. When the individual proceeds from the child phase to the parent phase, the parent dies and a new child is born. The overlapping generations scheme is depicted below, where k and p denote child and parent phases respectively.

Generation	Periods							
	1	2	3	4	5	6	7	8
i-1	k	k	p	p				
i			k	k	p	p		
i+1					k	k	p	p

Since the analysis is aimed at inter vivos transfers, the model will focus solely on transfers that take place when generations overlap. The bequest motive is not operative, where a bequest is defined as a transfer from a parent in generation i to a parent in generation i+1. Conversely, a parent in generation i cannot borrow against the income of a parent from a future generation. Transfers flow only between individuals in overlapping generations. To simplify the analytical results (without losing anything essential), we assume that a child cannot borrow against future income, and that the child would rather borrow than shift own-income from the child to parent phase or from period 1 to 2 during the child phase. The parent has access to capital markets.

1. Altruism

With these assumptions, the scheme can be reduced to a simple two-period model with a family comprised of two individuals, the parent and the child. Transfers take place when generations overlap. We now consider the transfer under two alternative assumptions: altruism and exchange.

With altruism, the parent cares about the child's well-being. The parent's objective function is:

$$U = U_1(C_{p1}, V_1(C_{k1})) + \frac{U_2(C_{p2}, V_2(C_{k2}))}{(1 + \rho)} \qquad (4.1)$$

where U_i = parent's level of well-being in period i, i = 1,2,

C_{pi} = parent's consumption in period i

V_i = child's level of well-being in period i,

C_{ki} = child's consumption in period i,

and ρ = the subjective rate of time discount.

The function U is assumed to be increasing and concave in each of its arguments, and the subjective rate of discount is equal for parent and child.

The objective function is maximized subject to the following constraints:

$$C_{p1} + \frac{C_{p2}}{(1+r)} + T_1 + \frac{T_2}{(1+r)} = E_{p1} + \frac{E_{p2}}{(1+r)} \tag{4.2}$$

$$C_{k1} = E_{k1} + T_1, \tag{4.3a}$$

and

$$C_{k2} = E_{k2} + T_2, \tag{4.3b}$$

where

E_{pi} = parent's earnings in period i,

E_i = child's earnings in period i,

T_i = transfers made from parent to child in period i,

and r = the market rate of interest.

The nature of constraints (4.2) and (4.3a-b) is such that the parent has access to capital markets but the child does not. The child cannot borrow in the market and must consume out of current earnings and transfers.

We now solve for an interior solution for transfers. Define the individual's "endowment" marginal utility of consumption as the marginal utility of consumption when no transfers take place. In symbols let us denote this endowment marginal utility as $\left(\frac{\partial U_i}{\partial C_i}\right)^\circ$, $i = 1,2$, $j = p,k$. A transfer from parent to child in period i will take place if $\left(\frac{\partial U_i}{\partial C_{pi}}\right)^\circ < \left(\frac{\partial U_i}{\partial C_{ki}}\right)^\circ$,

and write an expression for the latent variable that determines the transfer decision as:

$$t_i = \left(\frac{\partial U_i}{\partial C_{ki}}\right)^{\circ} - \left(\frac{\partial U_i}{\partial C_{pi}}\right)^{\circ} \qquad (4.4)$$

and $T_i > 0$ iff $t_i^* > 0$,

$T_i = 0$ otherwise.

Diminishing marginal utility implies that:

$$\frac{\partial t_i^*}{\partial E_{kf}} < 0 \quad i = 1,2 \qquad \frac{\partial t_i^*}{\partial E_{kf}} > 0 \quad i \neq f$$

and $$\frac{\partial t_i^*}{\partial E_{pf}} < 0 \quad i = 1,2,\ f = 1,2.$$

The latent variable t^* is inversely related to the child's contemporaneous earnings and positively related to his earnings in other periods. A rise in contemporaneous income eases the child's liquidity constraint in the current period, reducing t^*. A rise in child's earnings in a period other than the current period will raise his optimal consumption profile. With current earnings held constant, this implies a rise in t^*. Finally, a rise in parental earnings, E_{pi}, $i = 1,2$, increases the child's optimal consumption and, therefore, t^*. The comparative statics results for transfer levels, T_i^*, follow precisely the same pattern as those for t_i^*.

Given an interior solution for private transfers, the child pursues a non-liquidity constrained consumption path. Operative transfers imply that the time path for child consumption is determined by the following Euler equation:

$$\frac{\partial V_k}{\partial C_{k1}} = \frac{(1+r)}{(1+\rho)} \frac{\partial V_k}{\partial C_{k2}}. \qquad (4.5)$$

This is precisely the equation that would have determined consumption had the child not been liquidity constrained.

2. Exchange Through Inter-generational Loans

In this model, family members make transfers that arise out of bargaining over the terms of an inter-generational loan. As before, the child is liquidity constrained in the first two periods, but each family member cares only about his own consumption. Though family members are selfish, they honor their commitments. In particular, the child will repay loans from the parent. The parent knows this but the bank does not. This situation corresponds to the informational linkage that leads to the constraint. We also assume that the child cannot make borrowing arrangements with anyone else; the parent is the only source of funds. This assumption is not necessary but simplifies the exposition. Finally, the child is willing to borrow at rates higher than the market rate of interest. The parent, therefore, has an incentive to lend to the child because he can earn an above market rate of return on his saving. For simplicity, loan repayments take the form of monetary payments.

Inter-generational lending is a bilateral monopoly problem. The terms of the loan are determined by selfish bargaining. Let us first assume that the parent dominates the bargaining arrangement. Other bargaining frameworks are considered later.

Since the parent dominates the bargaining, the child receives his "threat-point" utility, defined as the utility the child would obtain if he

walked out on the game and pursued a liquidity constrained consumption path. The child's utility function is:

$$V_k = V_1(C_{k1}) + \frac{V_2(C_{k2})}{(1+\rho)} = V_1(E_{k1}) + T + \frac{V_2(E_{k2}-R)}{(1+\rho)} \tag{4.6}$$

where T denotes parental loans and R denotes repayments. The function V is increasing and concave in each argument. The child threat-point utility level is

$$\overset{\circ}{V}_k = \overset{\circ}{V}_1(E_{k1}) + \frac{\overset{\circ}{V}_2(E_{k2})}{(1+\rho)}. \tag{4.7}$$

The parent's problem is to maximize the gains from lending, $-T + \frac{R}{(1+r)}$, subject to the constraint that the child remains in the game, in other terms, $V_k = \overset{\circ}{V}_k$.

The first issue is the existence of an interior solution for transfers. Define the child's marginal utility of consumption at the endowment point (where transfers equal zero) as $\frac{\partial V_k}{\partial E_{ki}}$ $i = 1,2$. The parent's gains from trade exist if $\frac{\partial V_k}{\partial E_{k1}} > \frac{(1+r)}{(1+\rho)} \frac{\partial V_k}{\partial V_{k2}}$. Define the latent variables

$$\tilde{t} = \frac{\partial V_k}{\partial E_{k1}} - \frac{(1+r)}{(1+\rho)} \frac{\partial V_k}{\partial E_{k2}}, \tag{4.8}$$

and $T, R > 0$ iff $\tilde{t} > 0$

$T = R = 0$ otherwise.

From the concavity of the utility function, $\frac{\partial \tilde{t}}{\partial E_{k1}} < 0$, $\frac{\partial \tilde{t}}{\partial E_{k2}} > 0$. The latent variable that determines the occurrence of a transfer is inversely

related to contemporaneous child earnings and positively related to future child earnings. These results are the same as those of the altruism model but the reason is different. Here, transfers take place if the child's demand price for a consumption loan is greater than the market rate of interest. A fall in first period earnings or a rise in second period earnings will increase the demand price.

Three results for the latent variable differ from the altruism model. First unlike t_i^*, the variable $\bar{t}$ is not indexed by time. If $\bar{t} > 0$, both transfers and repayments occur. Second, $\bar{t}$ does not depend on parent earnings. The transfer decision is determined solely by the relationship between the child's demand price for a loan and the market rate of interest. The latent variable would be influenced by parental earnings, however, given a connection between parental earnings and the interest rate faced by him. Finally, given an interior solution, the first period transfer, T_1, need not be inversely related to E_{k1}. An increase in E_{k1} raises the child's threat-point, making borrowing terms more favorable. This can result in a positive relationship between current earnings and transfers.

Given that lending takes place, the time path of child consumption is determined by the relationship between the subjective rate of time preference and the market rate of interest, so that:

$$\frac{\partial V_k}{\partial C_{k1}} = \frac{(1 + r)}{(1 + \rho)} \frac{\partial V_k}{\partial C_{k2}}.$$

This is identical to expression (4.6) above. Despite the difference in transfer motives, both altruism and selfish bargaining imply that child consumption is determined by the Euler equation when inter vivos transfers are operative.

The parent-dominates assumption is extreme. It implies that the child is no better off in the loan relationship than on his own. The more realistic (but also more cumbersome) Nash solution to the bargaining problem involves choosing T and R to maximize the Nash product:

$$N = (V_k - V_k^\circ)\,(U_p - U_p^\circ) \tag{4.9}$$

$$= \left\{ V_1(E_{k1} + T) + \frac{V_2(E_{k2} - R)}{(1+\rho)} - V_1^\circ(E_{k1}) - \frac{V_2^\circ(E_{k2})}{(1+\rho)} \right\}$$

$$\times \left\{ U_p(W_p - T + \frac{R}{(1+r)}) - U_p^\circ(W_p) \right\}$$

where U_p° denotes parent threat-point utility and W_p denotes parental wealth.

The solution to (4.9) implies comparative statics that are qualitatively similar to the parent-dominates results. They also imply a more realistic outcome; the child receives utility gains from the relationship with the parent.

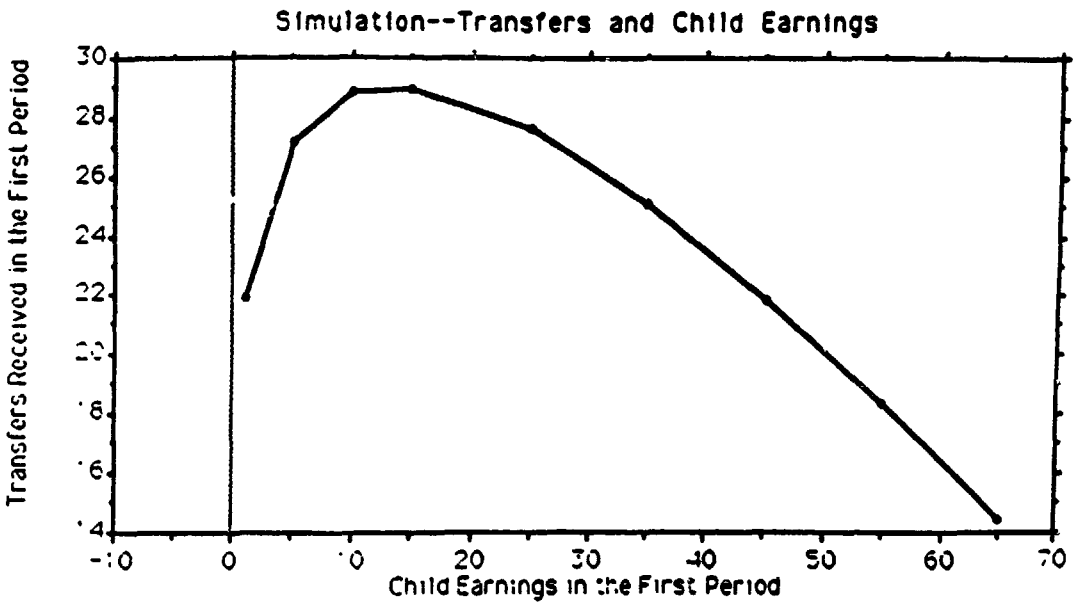
The child-dominates solution also produces results that are qualitatively similar to the parent-dominates case. In each case, the probability of transfer receipt is inversely related to current child earnings but positively related to future child earnings.

3. <u>Transfers Amounts and Altruism Versus Exchange</u>

So far we have looked at comparative statics for transfer events. We now focus attention on transfer amounts. The comparative statics are different for altruism versus exchange. Under altruism, transfer amounts are inversely related to child earnings, so that, for example, $\partial T_1/\partial E_{k1}<0$. Exchange implies a different pattern for the relationship between child

earnings and transfers. A rise in first period child earnings diminishes the demand for consumption loans in the first period, but also increases his "threat-point" utility. The latter effect can cause an increase in first period transfers. The comparative statics results indicate that first period transfers can first rise then fall as with E_{k1}. These results are demonstrated most easily with a simulation.

To show the inverted U-shaped relationship that can occur between transfers received in the first period and child earnings in the first period, consider a simulation using logarithmic utility for parent and child and Nash bargaining. The assumed parameter values are as follows: $W_p = 500$, $E_{k2} = 100$, $\rho = .18$, and $r = .20$. E_{k1} varies from 1 to 65. We wish to determine the path of transfers as E_{k1} changes. The simulation results are as follows:



The figure shows how, with exchange, transfers can first rise then fall with earnings. The prediction, therefore, is that transfers received and earnings follow a non-linear pattern.

C. Data

The data set used in the empirical implementation is the Peruvian Living Standards Survey (PLSS), conducted by the World Bank in conjunction with the Peruvian Instituto Nacional de Edtadistica (INE). The PLSS gathered socioeconomic information for a sample of 5,109 households, and gathered data for about 27,000 persons. Field work for the PLSS was done between June 1985 and July 1986.

The household is the unit of observation for our analysis. We deleted households with missing data for any of the following: private transfers, age, education of household head, parental schooling, illness, household size, gender of household head, consumption and indicator of urban/rural residence. This sample selection rule reduced the original 5,109 to 4,184. We confine our attention to urban households. Focussing on urban households reduces the sample size from 4,184 to 2,241.

Of the 2,241 households in our sample, 757 reported giving a private transfer to another household and 723 reported receiving a private transfer from another household. Two hundred and eighty two reported both giving and receiving a transfer. Information of the incidence of private transfers in the sample is given below:

	Number	Percentage of Sample (N = 2,241)
Households Giving a Transfer	757	33.78
Households Receiving a Transfer	723	32.26
Households Both Giving and Receiving	282	12.58
Households Neither Giving Nor Receiving	1,043	46.54

Because some households both gave and received transfers, we focus on net transfers received (in other words, transfers received minus transfers given) and net transfers given (transfers given minus transfers

received) in the analysis that follows. We define a household as a net transfer recipient if gross transfers received exceed gross transfers given. A household is a net transfer donor if gross transfers given exceed gross transfers received.

Selected characteristics of households in the sample are presented in Table 4.1 according to transfer status. Transfer status is divided into net recipient, net donor and those households whose net transfer equals zero. For convenience, we denote this group as "others." Because 282 households both gave and received a transfer, some givers are included in the "net recipients" category and some recipients are included in the "net donors" category. For simplicity, throughout the rest of the paper we will refer to net transfer recipients as "recipients" and net transfer donors as "donors" or "givers." Further, 24 households gave and received the exact same amount. So the "others" category in Table 4.1 contains 1,067 households, even though 1,043 neither gave nor received private transfers.

Average income ranks highest for givers and lowest for recipients. The same is true for social security income, which is indicated separately and not included in the measure of total monthly income. Human capital indicators mirror the pattern for income. Donors are better educated than recipients or "others." The proportion of female-headed households is lowest among donors and highest among recipients. The incidence of unemployment is highest among recipients and lowest among donors. The proportion of households reporting some illness in the prior 12 months is higher for recipients than for donors, but incidence of illness is lowest among the "others." The proportion of donors who contribute to the social security system is much higher than the sample average.

Table 4.1. Selected Characteristics of Urban Households by Private Transfer Status

Variables	(1) Net Transfer Recipients	(2) Net Transfer Donors	(3) Others a/	(4) All Households
Income				
Total monthly income (intis)	1,368.75	2,233.57	2,029.14	1,917.04
Income from compensation	1,348.16	2,204.86	2,007.82	1,893.90
Other income b/	20.60	28.71	21.32	23.13
Proportion with social security income	0.072	0.083	0.084	0.081
Social security income	23.67	30.07	33.12	29.90
Proportion paying social security tax	0.373	0.520	0.376	0.414
Social security tax payments	10.07	18.96	23.80	19.01
Education				
No schooling	0.069	0.033	0.058	0.054
Initial	0.005	0.008	0.004	0.005
Primary	0.396	0.322	0.421	0.388
Secondary	0.322	0.334	0.300	0.315
Secondary-technical	0.042	0.068	0.049	0.052
Post-secondary	0.040	0.058	0.031	0.041
University	0.125	0.178	0.138	0.145
Other Characteristics				
Age of household head	46.95	44.32	46.07	45.82
Nonmarried	0.076	0.069	0.047	0.060
Female-headed households	0.276	0.094	0.142	0.163
Ill last 4 weeks	0.597	0.505	0.460	0.507
Unemployed last 12 months	0.394	0.152	0.212	0.242
Homeowner	0.542	0.526	0.595	0.563
No. of children out of household	0.57	0.98	0.48	0.64
No. of children out of household in school	0.54	0.92	0.44	0.59
Household size	4.87	4.84	5.46	5.14
Father's education (years)	4.72	4.81	4.32	4.55
Mother's education (years)	3.11	3.23	2.92	3.06
Transfers Proportion giving net transfers	0.000	1.000	0.000	0.270
Net transfers given (amount)	0.00	181.27	0.00	49.02
Proportion receiving net transfers	1.000	0.000	0.000	0.253
Net transfers received (amount)	226.89	0.00	0.00	57.51
Proportion giving gross transfers	0.224	1.000	0.022	0.338
Gross transfers given (amount)	11.846	193.21	1.01	55.73
Proportion receiving gross transfers	1.000	0.216	0.022	0.323
Gross transfers received (amount)	238.74	11.94	1.01	64.22
Number of cases	**568**	**606**	**1067**	**2241**

a/ Neither a net transfer recipient nor a net transfer donor.

b/ Other income includes income from allowances, insurance, non-profit organizations, interest and dividends, gambling and miscellaneous income.

The family background indicators--father's and mother's education--are higher for recipients and givers than for "others." Household size is also smaller for recipients and givers than for "others." But the proportion of homeowners is higher for "others" than for either recipients or givers. The number of children outside the household is highest for givers and lowest for "others."

The average of net transfers received for the entire sample is 57.51 intis--3 percent of total income. To put these figures in perspective, they are roughly double the comparable figures for social security pension income. (Social security is the predominant public transfer program in Peru.) The average net transfer given is 49.02 intis.[1] The average net transfer receipt among recipients is 226.89 intis--16.6 percent of recipient income. The average net transfer given among donors is 181.27 intis--8.1 percent of donor income. So private transfers are non-trivial in terms of both incidence and magnitude.

The average age of recipients is only about two years higher than that of donors. But the approximate similarity in ages across transfer categories masks a subtle and important age pattern in private transfers, which we discuss in a later section.

1/ Curiously, there seems to be no tendency to exaggerate transfers given and/or or under-report transfers received. If anything, any reporting bias appears to go in the other direction. This finding runs counter to some of the evidence reported in Cox and Raines (1985), in which reported transfers given often exceeded transfers received for a United States cross section.

D. Empirical Estimates

1. Estimating Forms

Both altruism and exchange models predict that the probability of receiving a transfer should be inversely related to current income. Two forms of current income are in the probit equation: total monthly income (denoted as simply "income") and social security income. To capture the effects of income fluctuations on transfers, we also include dummies for whether anyone in the household has been ill or unemployed during the past 12 months, and whether the head of the household is a homeowner.

To gauge the possible effects of liquidity constraints on transfer behavior, we enter dummy variables for educational attainment and age. The latter is entered as a cubic function. Holding current income constant, education increases permanent income, which is expected to increase desired consumption and, therefore, increase the probability of transfer receipt. The rationale for the age variable is as follows. With income constant and common age compensation pr-files, lower age indicates higher permanent income for households early in the life cycle. For households at the beginning of the life cycle, therefore, an increase in age should be associated with a decrease in the probability of transfer receipt. Later in the life cycle, as households are repaid for loans they made to younger households, the probability of transfer receipt should increase with age. In sum, the liquidity constraint--consumption loans hypothesis predicts a U-shaped profile for the probability of transfer receipt over the life cycle.

Previous studies of transfer behavior indicate that gender of household head is an important determinant of transfer behavior. Evidence from developing countries (for example, Lucas and Stark (1985; Botswana) and Kaufman and Lindauer (1986; El Salvador)) indicate a positive

relationship between transfers and female status. Similar evidence has been found for the United States (Cox, 1987). Further, marital status has been found to be a powerful determinant of transfer behavior in the United States (Cox, 1987). And each of these variables has a possible interpretation as an indicator of the provision of inter-household services. For these reasons, we enter gender and marital status dummies in the probit equation for transfer receipt. We also include household size as a regressor.

To control for donor's income, we include father's and mother's years of education, and the number of children outside of the household and those children outside of the household who are in school.[2]

Indexing households by h and adding a stochastic component, we express the latent variable that determines the transfer decision as:

$$t_h = a_0 + a_1 I_h + bX_h + \epsilon_h, \qquad (4.10)$$

and

$$T_h > 0 \quad \text{iff } t_h > 0,$$

$$T_h = 0 \quad \text{otherwise.}$$

When the latent variable t_h crosses the threshold 0, transfers, T_h become positive. Otherwise, they are zero. The variable I_h denotes household income; the sign hypothesis is $a_1 < 0$. The education, age and demographic variables are denoted by the vector X_h.

2/ In later equations we include more comprehensive measures of the donor's income potential. (See Table 5.1).

The estimating equation for transfer amounts is given by

$$T_h = b_0 + b_1 I_h^{(1)} + b_2 I_h^{(2)} + bX_h + E(\eta_h \mid T_h > 0), \qquad (4.11)$$

where

$$I_h^{(1)} = I_h \quad \text{if} \quad I_h < I_h^* \qquad (4.12)$$

$$= \overset{*}{I}_h \qquad I_h \geq \overset{*}{I}_h$$

$$I_h^{(2)} = 0 \quad \text{if} \quad I_h \leq I_h^*$$

$$= I_h - I_h^* \qquad I_h > I_h^*$$

and η_h is a random error component.

Income enters the equation for transfer amounts in splined form. The bargaining model predicts a non-linear relationship between recipient income and transfer amounts received. The spline formulation is useful for testing for the presence of an inverted U-shaped relationship between recipient income and transfers. The altruism model, on the other hand, predicts negative coefficients for both b_1 and b_2.

2. Results: Who Receives Transfers and How Much?

Estimates of equations (4.1) and (4.2) are given in Table 4.2. The first two columns of Table 4.2 contain the probit estimates. Total monthly income enters the probit equation with a negative sign, and is significant at the .01 level. The coefficient indicates that a 1,000 inti increase in income is associated with a 1.2 percentage point decline in the probability of receiving a transfer. The coefficient for social security income is also negative and significant at the .01 level. A 100 inti

Table 4.2. Probit and Generalized Tobit Estimates
Transfers Received a/

Variable	Probit Coefficient	Probit Asymptotic t-value	Generalized Tobit Coefficient	Generalized Tobit t-value
Income				
Income	-0.379×10^{-4}	-2.65	-.-	-.-
Low income	-.-	-.-	0.113	3.38
High income	-.-	-.-	-0.016	-1.12
Social security income	-0.725×10^{-3}	-2.95	-0.114	-0.60
Education				
Initial	0.076	0.18	9.697	0.03
Primary	0.132	0.93	-2.343	-0.02
Secondary	0.153	0.98	114.739	0.92
Secondary-technical	0.014	0.07	64.546	0.39
Post-secondary	0.229	1.08	100.289	0.57
University	0.137	0.75	274.421	1.87
Household Characteristics				
Age	-0.181	-3.46	-0.152	-0.08
Age squared	0.297×10^{-2}	2.78	-.-	-.-
Age cubed	-0.142×10^{-4}	-2.05	-.-	-.-
Nonmarried	-0.154	-1.14	-40.055	-0.39
Female-headed household	0.476	5.49	176.562	2.32
Ill last 12 months	0.197	3.23	-94.460	-1.69
Unemployed last 12 months	0.426	5.82	140.674	1.87
Homeowner	-0.034	-0.53	59.771	1.07
No. kids out of h.h.	-0.181	-1.45	14.581	0.14
No. kids out of h.h. in school	0.179	1.38	-14.607	-0.14
Household size	0.017	1.25	17.443	1.52
Father's education	0.014	1.21	16.319	1.73
Mother's education	0.127×10^{-2}	0.10	-1.937	-0.20
Inverse Mill's ratio	-.-	-.-	-54.478	-0.39
Constant	2.080	2.56	-135.144	-0.51
Recipients	568	Observations	568	
Observations	2241	R-squared	0.10	
Log likelihood	-1157.8	F-statistic	2.91	

a/ In probit analysis, dependent variable is transfer receipt--transfer receipt=1 if transfer received, 0 otherwise. In Generalized Tobit analysis, dependent variable is net transfer amount received.

increase in social security income is associated with a 2.3 percentage point decline in the probability of transfer receipt.[3]

Educational attainment is positively related to the probability of transfer receipt, but its effects are imprecisely measured. The point estimates indicate that having a university degree raises the probability of transfer receipt by 4.7 percentage points, compared to the reference category (no education).

The probit estimates indicate that transfers are targeted toward female-headed households, and that being unemployed or ill during the past 12 months raises the probability of receiving a transfer. Being female raises the probability of transfer receipt by 21.2 percentage points. Being unemployed raises the probability by 15.3 percentage points, and being ill raises it by 6.7 percentage points.

The coefficients for the cubic function of age are highly significant and reveal a striking life cycle profile for the probability of transfer receipt. With other variables set at their sample means, the predicted probability of transfer receipt at age 16 is 0.625. The predicted probability then falls, reaching a minimum of 0.184 at age 45. The probability rises throughout the rest of the life-cycle, reaching, for example, 0.423 at age 65.

Figure 4.1 displays the life cycle profile of the probability of transfer receipt. Its U-shaped pattern mirrors the inverted U-shaped

---

3/ We discuss the effects of social security on transfer behavior in more detail in another paper (Cox and Jimenez, 1989b).

Figure 4.1

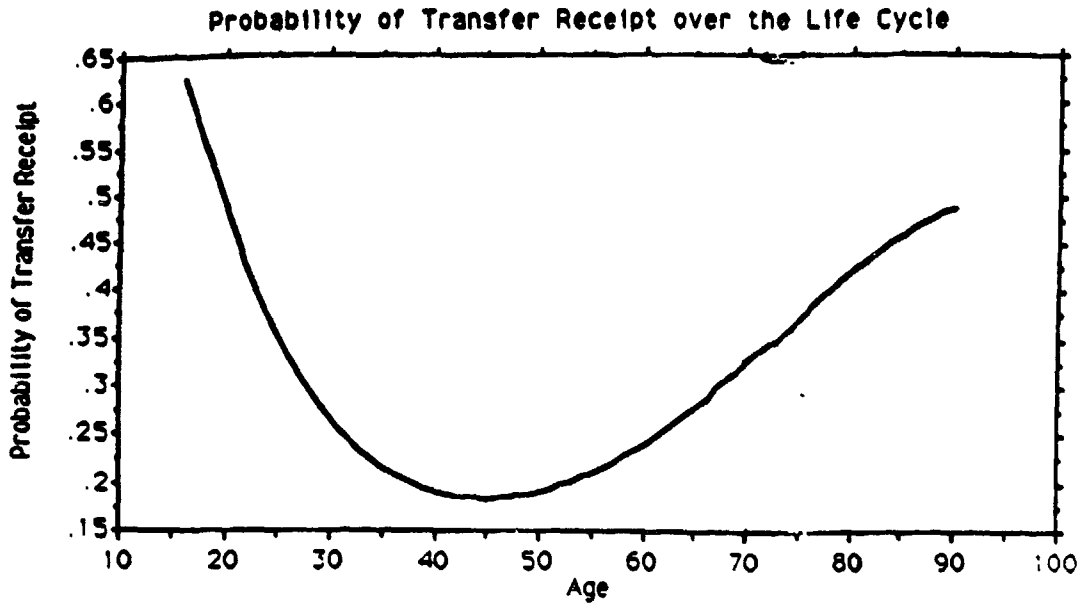
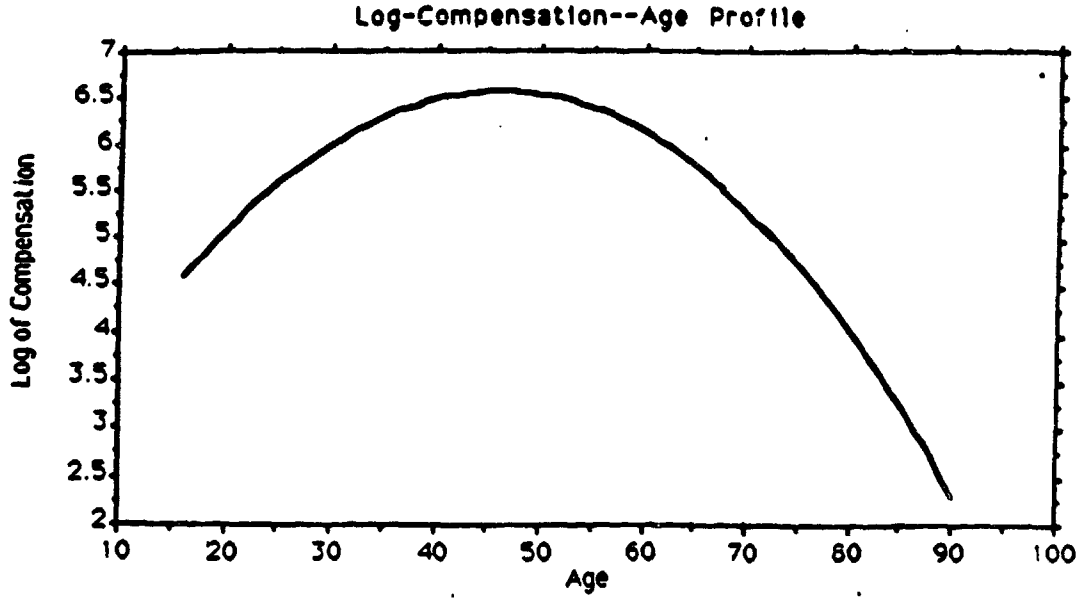


Figure 4.2



pattern of the log compensation--age profile displayed in Figure 4.2. The log of compensation =

$$\underset{(1.64)}{1.106} + \underset{(7.71)}{0.203}(\text{age}) - \underset{(-8.34)}{0.0022}(\text{age squared}) + \underset{(2.52)}{0.668}(\text{primary})$$

$$+ \underset{(3.22)}{0.892}(\text{secondary}) + \underset{(1.63)}{0.596}(\text{technical}) + \underset{(2.73)}{1.066}(\text{post-secondary})$$

$$+ \underset{(3.75)}{1.120}(\text{university})$$

log likelihood = -5209.34, non-limits = 1973, observations = 2241. Figure 4.2 is plotted with the education variables set to sample means. The profile of log compensation shows the familiar concave shape, and peaks at age 46.[4] So the peak of log compensation coincides roughly with the trough of the probability of transfer receipt. The close relationship between the two profiles suggests strongly that transfers respond to liquidity constraints. Transfer incidence falls when compensation rises, and rises when compensation falls. The rising part of the transfer probability profile also suggests that transfer receipts later in the life cycle represent repayments for inter-generational loans.

The next two columns in Table 4.2 contain generalized Tobit estimates of transfer amounts.[5] The most important finding is the

---

4/ We estimate a cubic specification of the log compensation profile, but the cubic age term was not statistically significant. A plot based on the cubic specification is very similar to one in Figure 4.2.

5/ The probit equation used to generate the inverse Mills ratio contains the same explanatory variables as the probit in Table 4.2, plus additional terms. Income, age marital status, female status, illness and unemployment are entered interactively. And we use a splined specification for income. The node of the income spline is set at 3,000 intis. The reason for this specification is that the extra variables are needed to identify the general Tobit. Using only the vector to contained in the probit in Table 4.2 construct the inverse Mills ratio results in extreme multicollinearity and unstable estimates.

estimated effect of income on transfer amounts received. Income enters the generalized Tobit in splined form. The node of the spline is set at 3,000 intis.[6] At incomes lower than 3,000 intis, increases in income are associated with higher transfer amounts received. A one inti increase in income prompts an 11 cent increase in transfers received. This positive coefficient is estimated very precisely. At incomes higher than 3,000 intis, a one inti increase in income is associated with about a 2 cent reduction in transfer receipts. This finding runs counter to the altruism model, which predicts a large inverse relationship between income and transfer amounts received.

Social security income is inversely related to transfers received but the estimate is imprecise. The point estimate indicates a one-inti increase in social security income and is associated with an 11 cent reduction in transfer amounts received, but the standard error of the estimate is almost twice as large as the coefficient (see the next chapter for further analysis).

Education is positively related to transfer amounts received but, as in the probit equation, the estimates are imprecise. The only coefficient that approaches statistical significance is that of the university degree. Having a university degree is associated with a 274 inti increase in transfer amounts; the coefficient is significant at the .06 level.

Age is far more important for transfer events than transfer amounts. In contrast to the large and precisely estimated age pattern in

---

6/ We varied the node of the spline in 500 inti intervals. A node of 3,000 maximizes the log-likelihood.

the probit equation, the generalized Tobit estimates indicate that age has a negligible effect on transfer amounts received.[7]

The findings for the relationships between both female and unemployed status and transfer amounts are consistent with the findings from the probit estimates. Other things being equal, transfers received by female-headed households are 177 intis higher than those received by male-headed households. And being unemployed in the past 12 months raises transfers received by 141 intis. To appreciate the size of these numbers, recall that the average transfer amount among recipients (Table 1) is 227 intis.

Unlike the findings for female status and unemployment, however, being ill is associated with a reduction in transfer amounts received. The coefficient indicates that being ill in the last 12 months is associated with a 94 inti decline in transfers. The coefficient is on the margin of statistical significance (significance level = .09). This finding is difficult to reconcile with altruism. Under altruism we might expect higher transfers for households affected by illness, since it probably entails added expenditures and causes a decline in well-being. On the other hand, being ill is likely to reduce the amount of inter-household services that household members can perform. Even those who continue to do so will perform these service at a relatively low quality level. This is one possible explanation for the opposite signs for the illness variable in the probit and generalized Tobit equations.

7/ Entering higher order terms for age failed to reveal any non-linear relationship between age and transfer amounts received.

The coefficient for household size indicates that bigger households receive higher transfers, but the coefficient is rather small. A one person increase in household size is associated with only a 17 inti increase in transfers. The educational attainment of the household head's father is associated with higher transfers, but that of the household head's mother is not.

Marital status has a negligible effect on transfers received (both incidence and amounts). This finding contrasts sharply with findings for the United States, which indicate that being married reduces greatly the probability of receiving an inter-vivos transfer (Cox, 1987).[8] Further, the number of children outside of the household has little effect on either transfer incidence or amounts.

Finally, the coefficient on the inverse Mill's ratio indicates that sample selection bias appears not to be an important problem in estimating the equation for transfer amounts.

3. Results: Who Gives Transfers and How Much?

The first two columns of Table 4.3 contain probit estimates for transfers given. The vector of explanatory variables in the donor's probit is similar to that of the recipient's probit, except that we add a quadratic in total monthly income and include variables for social security tax payments.

8/ The percentage of households in the PLSS containing married couples (94 percent) is much higher than the percentages in the United States survey microdata samples. The percentage of households with married couples in the President's Commission on Pension Policy survey data sets used in Cox (1987), for example, was 63 percent (calculated from Table B1.p. 544).

Table 4.3. Probit and Generalized Tobit Estimates
Transfers Given a/

Variable	Probit		Generalized Tobit	
	Coefficient	Asymptotic t-value	Coefficient	t-value
Income				
Income	0.679×10^{-4}	3.29	0.012	1.47
Income squared	-0.130×10^{-8}	-1.95	-.-	-.-
Social security income	0.150×10^{-3}	0.96	-0.212	-0.90
Pays into social security	0.337	5.17	-121.448	-1.54
Social security tax payments	-0.157×10^{-3}	-0.33	-0.269	-0.50
Education				
Initial	0.541	1.32	-124.136	-0.38
Primary	0.080	0.51	-62.635	-0.40
Secondary	0.238	1.40	-47.558	-0.28
Secondary-technical	0.403	2.00	-66.562	-0.34
Post-secondary	0.455	2.11	408.671	1.98
University	0.275	1.44	-24.486	-0.13
Household Characteristics				
Age	0.165	2.91	7.513	2.77
Age squared	-0.337×10^{-2}	-2.90	-.-	-.-
Age cubed	0.205×10^{-4}	2.71	-.-	-.-
Nonmarried	0.226	1.63	99.858	0.85
Female-headed household	-0.339	-3.42	-85.256	-0.79
Ill last 12 months	0.068	1.12	-15.418	-0.29
Unemployed last 12 months	-0.215	-2.63	-33.412	-0.36
Homeowner	-0.028	-0.44	78.560	1.42
No. kids out of h.h.	0.155	1.52	-6.861	-0.07
No. kids out of h.h. in school	0.087	0.81	2.375	0.03
Household size	-0.056	-4.03	-4.549	-0.32
Father's education	0.290×10^{-3}	0.03	39.986	4.18
Mother's education	-0.015	-1.23	-20.747	-1.92
Inverse Mill's ratio	-.-	-.-	-55.938	-0.26
Constant	-3.22	-3.65	-147.841	-0.47

Donors	606	Observations	606
Observations	2241	R-squared	0.09
Log likelihood	-1190.0	F-statistic	2.62

a/ In probit analysis, dependent variable is transfer--transfer=1 if net transfer given, 0 otherwise. In Generalized Tobit analysis, dependent variable is net transfer amount given.

The coefficients on income and income squared indicate the probability of giving a transfer rises with income, but at a decreasing rate. The effect of income is positive throughout almost all of the income range in the sample.[9] The declining marginal impact of income on transfers given is quite different from findings for bequest behavior in the United States (Menchik and David, 1983), which indicate a sharp rise in the propensity to give for incomes in the top 85th percentile.[10] At sample means, a 1,000 inti increase in income raises the probability of giving a transfer by 2.1 percentage points.

No clear pattern exists for the relationship between education and the probability of giving. Educational categories with the highest probabilities of giving are initial, technical and post-secondary (the reference category is no schooling). This finding contrasts with findings for inter-vivos transfers in the United States, where education has a strong positive impact on transfers given (Cox and Raines, 1985).

The age profile for the probability of transfers given is complex. The cubic in age is highly significant. Fixing all other explanatory variables at their sample means, the predicted probability of giving a transfer at age 16 is 0.117. The probability rises to a peak of 0.302 at age 37, then begins falling to a local minimum of 0.167 at age 72. The predicted probability of giving a transfer then rises sharply with age for the very elderly, reaching 0.305 for those household heads aged 90.

9/ The effect of income in the donor probit only turns negative after income of 26,115 intis. But only 7 of the 2,241 households in the sample had incomes higher than this.

10/ There is no evidence for such non-linearity, however, for inter-vivos giving in the United States (Cox and Raines, 1985).

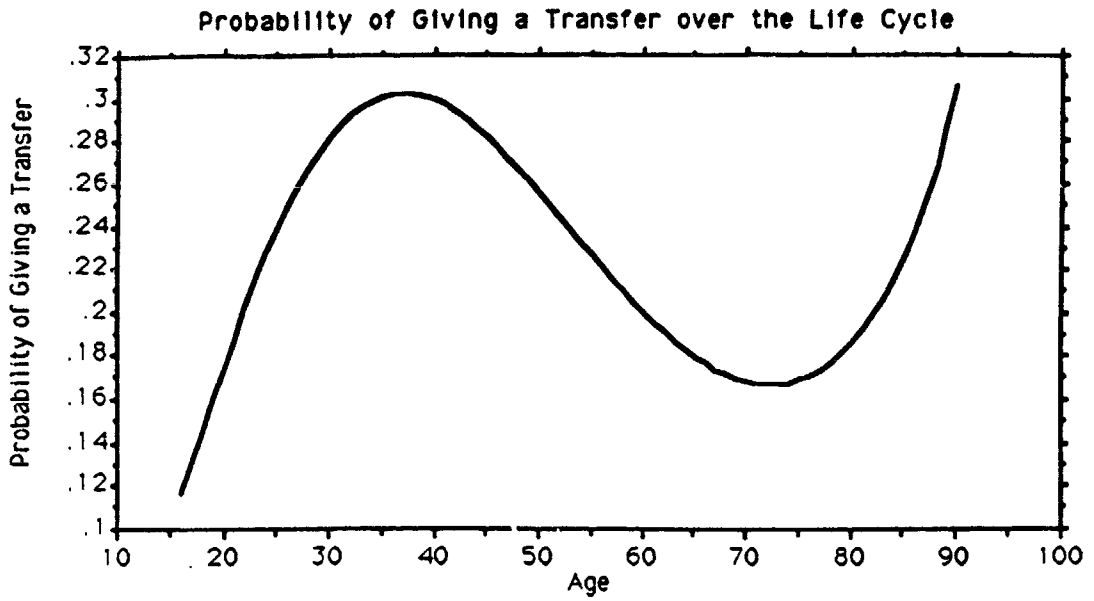
The age profile for the probability of giving a transfer is depicted in Figure 4.3. The first part of the profile conforms roughly to the inverted U-shaped profile for log compensation, but the peak in the transfers given profile comes nine years earlier than the one for log compensation. The dramatic upward curl in the transfers given profile that occurs after age 72 applies only to the small minority of very elderly households. Only 4.4 percent of the sample is aged 72 or over. The upward curl probably picks up the effects of bequests. For example, suppose a member of an elderly household dies sometime in the survey period. Suppose he leaves a survivor but also bequeaths something to another household. The survivor might report the bequest as part of total private transfers given by the household.

The probit estimates in Table 4.3 indicate that non-married, male-headed, small households are more likely to give transfers. Being unemployed in the last 12 months reduces the probability of giving a transfer but, surprisingly, being ill in the last 12 months does not. The coefficient for illness is actually positive, but it is small and only significant at the .26 level.

The last two columns of Table 4.3 contain the generalized Tobit estimates for transfer amounts given. Transfer amounts rise with income, father's education and age.[11] But amounts given are inversely related to mother's education. Like the estimates for transfer amounts received, selectivity bias does not appear to be an important problem in estimating equations for amounts given.

11/ Experimentation with higher order terms for age failed to reveal any non-linear age pattern for transfer amounts given.

Figure 4.3


Probability of Giving a Transfer over the Life Cycle
Probability of Giving a Transfer
.32
.3
.28
.26
.24
.22
.2
.18
.16
.14
.12
.1
10
20
30
40
50
60
70
80
90
100
Age

The probit and generalized Tobit each contain a vector of Social Security variables: Social security income, a dummy indicating whether the household pays social security taxes and the amount of taxes paid. The estimates in Table 4.3 reveal a puzzling pattern for the dummy variable. Paying into social security actually increases the probability of giving a transfer but reduces the amount given. The latter effect is less precisely estimated than the former. The remaining social security variables have very small coefficients.

E. Conclusions

Motives for private transfers determine their effect on public policy. An altruistic motive implies that private transfers will counteract the effects of policies that attempt to redistribute income. For example, a social security scheme which pays out pension benefits and which is financed by increased taxes will lead to less private transfers from altruistic donor households to the elderly.

An exchange motive does not necessarily lead to the neutralizing of public policy. This paper emphasizes the inter-generational loan aspect of exchange -- households have information that is unavailable to formal lenders and that can be used to make welfare improving transfers. These are primarily from households with middle-aged heads to liquidity constrained households with younger and elderly heads. In such a framework, income redistribution could even lead to a rise in private transfers.

The evidence for Peru indicates that private transfers are directed towards the very young and very old households. But pattern does not support the hypothesis that transfers are given primarily for altruistic motives. The magnitude of private transfers received rises with recipient income up to a point, and then declines. This is consistent with

with the exchange motive for transfer giving. Thus, private transfers should not completely neutralize public transfers.

The paper also indicates that alleviating liquidity constraints -- for example, by making financial markets work better to allow households with younger and elderly needs to borrow -- could change the motives for giving. However, this is a very preliminary view since there are other exchange motives that are also important, such as social security (discussed in the next chapter).

V. THE CONNECTION BETWEEN SOCIAL SECURITY AND PRIVATE TRANSFERS IN PERU

How effective are social security retirement benefits at raising the incomes of older households in developing countries? On the surface, it seems that social security should benefit older households at the expense of younger ones. A "pay-as-you-go" social security system taxes younger working households and distributes the proceeds to those who have retired. But this simple assessment could be inaccurate, due to informal private transfer among families.

Consider the (hypothetical) case of an elderly couple supported by their children. Suppose a social security program is created, which taxes the children and channels the funds to the elderly household. The children may decide to cut back their support, since their social security contribution accomplishes what they once did privately. The children's response would weaken social security's impact on the income distribution. Indeed, some U.S. researchers, notably Becker (1974) and Barro (1974), argue that private transfers render social security programs completely ineffective.

Do such findings hold in developing countries that are considering reforms in their social security system? Private transfers are an important component of household income and expenditure in virtually all the developing countries surveyed by Rempel and Lobdell (1978) and Chapter 2 of this paper. Much of the transfers flow from children to parents. Over a quarter of private transfers in a sample of Kenyan households were given to parents from their children (Knowles and Anker, 1981). Butz and Stan (1982) found significant transfers from young to old in Malaysia; Ravallion and Dearden (1988) discovered similar results in Java. In fact, some researchers (for example, Leibenstein, 1975) argue that, in developing

countries, old age security is the most important motive for having children.[12]

While the potential linkage between social security and private transfers has obvious policy significance, there is almost no empirical work on this issue. Part of the problem is due to data deficiencies; data-sets containing both private transfer and social security information are scarce. Many countries for which private transfer information exists have no social security programs or devote only a negligible fraction of their budgets to public income transfers. And using findings from industrialized countries with extensive public spending for social security--such as the United States--would likely be unreliable for making inferences about developing countries.[13] Further, inter-country comparisons among countries with data for private transfers are not feasible because of disparities in survey definitions for private transfers and sampling techniques.[14]

We use a new data set, the Peruvian Living Standards Survey (PLSS), to assess the link between social security and private transfers. The PLSS offers a number of advantages. First, a significant fraction of private transfers flow from young to old in Peru. Second, Peru has a social security program which accounts for over 3 percent of its Gross Domestic Product (Suarez-Berenguela, 1987). Further, the PLSS contains

---

12/ A lot of controversy surrounds the connection between old age security and fertility, however. See, for example, Vlassoff and Vlassoff's (1980) article for evidence against the old age security hypothesis and Nugent's (1985) review.

13/ In fact, private transfers from old to young in the United States are negligible (Cox and Raines, 1985), making the connection between social security and private transfers difficult to gauge using a cross section.

14/ For example, some surveys count in-kind time-related transfers while others do not; some surveys focus on low-income subsamples and others use representative cross-sectional samples.

labor-market and demographic information necessary to analyze private transfer behavior.

Peru is particularly well-suited for studying the effects of social security on private transfers. The country is an ideal balance between the extremes of very poor nations, like Kenya, which have significant private transfers but little public transfer spending, and the United States, which has a large social security system but negligible private transfers from young to old. We control for other determinants of private transfers in the Peruvian cross-section to isolate social security's private transfer impact.

In the sections that follow, we review theories of private transfer behavior in more detail and describe the Peruvian social security system. The empirical sections provide an overview of private transfers in Peru and test the hypothesis that social security supplants private transfers. By way of preview, we find that social security indeed displaces private transfers. But a complete "crowding out" of private transfers from Social Security, as envisioned by Becker and Barro, does not occur.

A. Theories of Private Transfers

The response of private transfers to social security depends on the motive for private transfers. The theoretical literature contains two primary views of transfer motives, altruism and self-interested exchange, though recent work has attempted to synthesize the two approaches.

1. Altruism

Modern analysis of the connection between social security and private transfers began with the seminal work of Barro (1974), which is based on the altruistic framework for private transfers advanced by Becker (1974). This framework assumes that the utility of the child, U_k, depends

on his consumption, C_k, and the utility of his parent, Up. The parent's utility, in turn, depends on his consumption, C_p, so that

$$U_k = U_k(C_k, U_pC_p)). \tag{5.1}$$

The child's consumption must equal his income, Ik, knet of any transfers, T, he makes to his parent. And the parent's consumption must equal his income, I_p, plus transfers received from the child.

Maximization of (5.1) implies that transfers will be given to achieve the optimal consumption of each family member. Each members' consumption depends only on aggregate family income, $I_k + I_p$ not the distribution of its components. A social security program that forces a transfer from child to parent, but leaves aggregate family income unchanged, will have no effect on either family member's consumption. The child will reduce his private transfer by the exact amount of the forced public transfer to keep the consumption of himself and his parents the same. In sum, the theory of altruistically motivated transfers predicts that forced transfers from social security merely supplant private ones, leaving individual consumption and well-being unchanged. Put another way, social security transfers completely "crowd out" private ones.

2. <u>Self-Interest</u>

Altruism is not the only possible motive for private transfers. An alternative hypothesis, common in the development literature, is that private transfers from young to old might be repayments for past assistance or insurance premiums against income shortfalls (Rempel and Lobdell, 1978). Further, transfers from young to old might function in part to pay for in-kind services, such as care of grandchildren.

The effects of social security with self-interested transfers differ from those with altruistic motives. As an illustration, consider a model based on pure self-interest, in which neither parent nor child cares about the other. Suppose inter-vivos transfers are self-interested loans made from older households to younger, liquidity constrained ones (Cox (forthcoming), Cox and Jappelli (1989)). In this instance, transfers from young to old are loan repayments. Changes in social security would influence self-interested lending behavior only insofar as current income and lifetime wealth of generation members are affected.

To see how self-interested motives can generate results different from the altruism model, consider the following example. Suppose social security taxes and benefits are increased in a way that leaves the lifetime wealth of younger generations unchanged but make older generation members wealthier. The current income of younger generations is depressed but their desired consumption would remain unchanged. If they are liquidity constrained, they would borrow more from older generations. More borrowing implies higher repayments to members of older generations later on. The enhanced lifetime wealth of older generation members reinforces this effect, because it puts these households in a better position to lend by lessening any credit constraints they may face. The end result is higher transfers from young to old as a result of the expansion of social security, which is the opposite of the prediction of the altruistic model.

Since the example is designed to illustrate the possibility that self-interested motives can generate different outcomes than altruism, it is somewhat contrived. It is possible to design other examples, based on self-interested motives, that have qualitative predictions similar to altruism. For example, if an expansion in Social Security reduces the lifetime wealth of younger generations, transfers from young to old in the

form of loan repayments can decline. But the exact crowding out of private transfers by public ones, which is the primary result of the altruism model, does not in general occur with self-interested transfer motives.

3. Altruism and Self-Interest

The pure self-interested lending model raises a question: if households are only looking after their own self-interest, why would they repay loans at all? Both Lucas and Stark (1985) and Kotlikoff and Spivak (1981) resolve this problem by positing that a combination of self-interested and altruistic forces govern private transfer behavior. Self-interested motives prompt households to enter an agreement to, say, lend or insure. But altruistic forces create the mutual trust necessary to circumvent the moral hazard inherent in such agreements.

This eclectic view of transfer motives must be interpreted with care. Two points are worth noting. First, the type of altruism envisioned by the authors above can differ from the Barro-Becker definition. For example, suppose someone lends to two households, A and B. Household A might care very much about the utility loss incurred by the lender from its own default. This is a form of altruism that A has for the lender and it makes the contract enforceable. But A might not care at all whether B defaults, as long as his own consumption possibilities remain unchanged. If so, this form of altruism helps enforce loan contracts but it differs from the Barro-Becker utility dependence given in equation (5.1).

Second, even if the form of altruism is of the Barro-Becker type, if it is combined with self-interested motives for transfers, only one transfer motive can determine the comparative statics results in a given instance, depending on which motive is operative at the margin (Cox and Jakubson, 1989). For example, suppose the last bit of income transferred was motivated by self-interest and purchased some service from the

recipient. In this instance, marginal changes in pre-transfer incomes induced by modifications in social security will not produce the Barro-Becker "crowding out" results, even though the donor is altruistic and private transfers occur The reason is that altruistic motives are not operative at the margin. The donor is only inframarginally altruistic: that is, he is made happier if the recipient receives a windfall income gain but is not willing to make a transfer to raise the recipient's utility.[15]

The best way to think of the connection between social security and the motives for private transfers is in terms of a dichotomy. Either the motive is purely altruistic, in the sense of Barro and Becker, in which case social security completely crowds out private transfers. Or, transfers are affected by some form of self-interested motive. In this case, even if altruistic motives are also present, complete crowding out will not occur.

B. The Social Security System in Peru[16]

Peru's social security system (the Spanish acronym is IPSS), which began in the early 1890s as a risk sharing plan for blue collar workers, covered about 40 percent of the economically active population by 1985. Coverage is mandatory for all wage and salary employees in public or private firms and cooperatives, but self-employed workers have an option to participate. Because of the focus on wage and salary work, coverage is

---

15/ Further, the altruism model of Barro and Becker employs an important assumption about the bargaining framework between donor and recipient--the donor dominates. Alternative frameworks, such as Nash bargaining, do not imply the Barro-Becker crowding out results (McElroy and Horney, 1981; Cox, 1987; Kotlikoff, Razin and Rosenthal, 1988).

16/ This section draws heavily on Mesa-Lago's (1985) and Suarez-Berenguela's (1987) description of IPSS.

concentrated in the high-income urban and formal sectors of the economy - white-collar workers, blue-collar workers in large firms and the military.

The main sources of funds are payroll contributions by insured persons and their employers. In 1987, covered workers were expected to contribute 5 percent of their salaries to social security. The corresponding rate of contributions for employers is 14 percent, plus 1-12 percent for work injury, depending on the risk of the occupation (US, SSA, 1987). Self-employed workers contribute 15 percent of their monthly income but the income basis for their contributions is subject to maximum and minimum levels. The government contributes to the system primarily as an employer.

Peru's social security system provides pension and health care benefits. Half of the employee and employer tax revenues are earmarked for pensions and the other half funds medical and maternity benefits. In terms of expenditures, medical and maternity benefits comprise a little under two-thirds of IPSS's total budget. Also, pension funds have been used to replenish the depleted health budget. In 1983, the system ran a deficit equivalent to 6.7 percent of total receipts (ILO).

Social security medical and maternity benefits cover only 14 percent of Peru's population. In contrast, health care from the Ministry of Health (MOH) covers over half the population. But Social Security health benefits are far superior to MOH benefits in terms of expenditures per person. Social Security's expenditures per person are five times that of MOH.

We will investigate both the pension and health care aspects of the social security system in the empirical work below. Like pensions, social security health benefits can also affect private transfer behavior. For example, illness would be likely to increase the probability of

receiving an altruistically motivated private transfer. Altruistic donors can increase their well being by making transfers to alleviate the suffering of those who are ill. But if the household affected by illness has high quality health insurance coverage, altruistic donors would have a diminished incentive to make transfers. The social security health care system would take over the function of private transfers. If private transfers are exchange motivated, the connection between social Security health benefits and private transfers would be much the same. Households with good health insurance would have less incentive to enter into private insurance schemes with other households. Social security health coverage would mitigate the financial risk of illness and diminish private transfers targeted toward the ill.

C. Data

The data set used to examine the connection between social security and transfer behavior is the Peruvian Living Standards Survey (PLSS), conducted by the World Bank in conjunction with the Peruvian Instituto Nacional de Edtadistica (INE). The PLSS gathered socioeconomic information for a sample of 5,109 households and gathered data for about 27,000 persons. Fieldwork for the PLSS was done between June 1985 and July 1986.

The household is the unit of observation for our analysis. We deleted households with missing data for any of the following: private transfers, age, education of household head, parental schooling, illness, household size, gender of household head, consumption and indicator of urban/rural residence. This sample selection rule reduced the original 5,109 to 4,184. Further, we focus on urban households which reduces the sample from 4,184 to 2,241. Social security is primarily an urban phenomenon. Urban households account for 85 percent of social security coverage.

The questions pertaining to inter-household transfers given are contained in Section 11, part E of the PLSS. Survey respondents were asked the following: "Has any member of your household sent money or goods--regularly or irregularly--to persons who are not members of your household during the last 3 months?" Respondents also reported the relationship between the recipients and household head (for example, son, parent). Respondents were asked to report the value, in intis, of cash and in-kind transfers given in the past three months. The same questions were asked for inter-household transfers received (Section 13, part B).

Of the 2,241 households in our sample, 757 reported giving a private transfer to another household and 723 reported receiving a private transfer from another household. Four hundred and forty six reported both giving and receiving a transfer. Information of the incidence of private transfers in the sample is given below:

	Number	Percentage of Sample (N = 4,184)
Households Giving a Transfer	757	33.78
Households Receiving a Transfer	723	32.26
Households Both Giving and Receiving	282	12.58
Households Neither Giving Nor Receiving	1,043	46.54

Because some households both gave and received transfers, we focus on net transfers received (in other words, transfers received minus transfers given) and net transfers given (transfers given minus transfers received) in the analysis that follows. We define a household as a net transfer recipient if gross transfers received exceeds gross transfers given. A household is a net transfer donor if gross transfers given exceed gross transfers received.

The breakdown of households according to net transfer status is given below:

	Number	Percentage of Sample (N = 4,184)
Net Transfer Donors	606	27.04
Net Transfer Recipients	568	25.35
Net Transfer Equals Zero ("Others")	1,067	47.61

Because 282 households both gave and received a transfer, some givers are included in the "net recipients" category and some recipients are included in the "net donors" category. For simplicity, throughout the rest of the paper we will refer to net transfer recipients as "recipients" and net transfer donors as "donors" or "givers." Further, 24 households gave and received the exact same amount. So the "others" category in the table above contains 1,067 households, even though 1,043 neither gave nor received private transfers.

The average of net transfers received for the entire sample is 57.51 intis--3 percent of total income. To put these figures in perspective, they are roughly double the comparable figures for Social Security pension income. The average net transfer given is 49.02 intis.[17] The average net transfer receipt among recipients is 226.89 intis--16.6 percent of recipient income. The average net transfer given among donors is 181.27 intis--8.1 percent of donor income. So private transfers are non-trivial in terms of both incidence and magnitude.

17/ Curiously, there seems to be no tendency to exaggerate transfers given and/or under-report transfers received. If anything, any reporting bias appears to go in the other direction. This finding runs counter to some of the evidence reported in Cox and Raines (1985), in which reported transfers given often exceeded transfers received for a United States cross section.

Survey respondents were asked to report the main sources of transfers received and destinations of transfers given, according to generation. Below is a summary of the primary sources of transfers received:

Source	Number of Transfers	Percentage of Transfers	Average Transfer	Percentage of Intis Transferred
1. Parents	163	28.7	232.7	29.4
2. Other Relatives	149	26.2	136.9	15.8
3. Children	158	27.8	209.5	25.7
4. Son or Daughter-in-Law	16	2.8	475.3	5.9
5. Grandchildren	5	0.9	129.1	0.5
6. Spouse	22	3.4	434.9	7.4
7. Non-relatives	55	9.7	356.8	15.2
TOTAL	568	100.0	226.9	100.0

Most of the transfers occur between parents and children. After these two categories, the most significant is that of "other relatives," who are the source of over a quarter of the transfers received, though only 16 percent of total intis received. Very few transfers received originated with grandchildren, in-laws or spouses. Non-relatives account for a significant minority of transfers.[18]

D. Empirical Estimates

1. Estimating Equations

We start by specifying an estimating equation for transfer received by households with older heads from those with younger heads. There are two questions to explore. First, what is the connection between social security and transfer events? Second, given that a transfer occurs,

18/ Note that since we are looking at inter-household transfers, inter-spousal transfers cannot occur unless the spouses are living in separate households.

how does social security affect transfer amounts received? These estimating equations can be derived from the theoretical models described in the previous section (see Chapter 4, above, for a more detailed model).

We use probit analysis to analyze the first question. We focus on the sample of households aged 45 or over. Indexing households by h and adding a stochastic component, we express the latent variable that determines the transfer decision as

$$t_h = a_0 + aI_h + bX_h - \varepsilon_h, \qquad (5.2)$$

and

$$T_h > 0 \quad \text{iff } t_h > 0,$$

$$T_h = 0 \quad \text{otherwise.}$$

When the latent variable t_h crosses the threshold 0, transfers, T_h become positive. Otherwise, they are zero. The vector I_h is a set of pre-private transfer income variables, and X_h is a vector of education and demographic variables. The stochastic component ε_h is assumed normally distributed.

We include three variables in the vector I_h: a dummy variable indicating whether the household receives social security income, the Social security income amount, and non-social security income, which includes earnings, financial income and income from a variety of other sources (for example, gambling, rental income).

The vector X_h captures the effects of transitory income fluctuations on transfers. It contains dummies for whether anyone in the household has been ill during the last four weeks or unemployed during the last 12 months. To measure additional household resources, we also include a dummy indicating whether the household is a homeowner, dummies for educational level and a cubic in age.

Previous studies of transfer behavior indicate that the gender of the household head is an important determinant of transfer behavior. Evidence from developing countries (for example, Lucas and Stark (1985; Botswana) and Kaufmann and Lindauer (1986; El Salvador)) indicate a positive relationship between transfers and female status. Similar evidence has been found for the United States (Cox, 1987). So we enter a dummy variable indicating whether the household head is female. We also include dummy variables for marital status and the number of children outside the household, and whether the household has no children living outside the household. And we include household size as a regressor.

The estimating equation for transfer amounts is given by:

$$T_h = c_0 + cI_h + dX_h + E(\eta_h \mid T_h > 0), \qquad (5.3)$$

where η_h is a random error component. The specification of the generalized Tobit equation for transfer amounts is similar to that of the probit equation, except we enter age linearly and do not include the variable for no children outside the household.[19]

2. Results

Table 5.1 contains the probit and generalized Tobit estimates. The dummy variable for whether the household receives income from Social Security is negative, large and statistically significant at the .01 level. At sample means, having income from social security reduces the

---

19/ The probit equation used to generate the inverse Mills ratio in the generalized Tobit contains the same vector of explanatory variables as the probit in equation (5.2) plus additional terms. Income, age, marital status, female status, illness and unemployment are entered interactively. And we use a splined specification for income. The node of spline is set at 3,000 intis. The reason for this specification is that the extra variables are needed to identify the generalized Tobit. Using only the vector contained in equation (5.2) resulted in extreme multicollinearity and unstable estimates.

Table 5.1: Probit and Generalized Tobit Estimates
Transfers from Young to Old
Transfers Received a/

Variable	Probit Coefficient	Probit Asymptotic t-value	Probit Mean	Generalized Tobit Coefficient	Generalized Tobit t-value	Generalized Tobit Mean
Income						
Income	-0.257×10^{-4}	-1.02	2261.200	0.026	1.07	1373.700
Has Soc. Sec.	-0.609	-3.43	0.149	86.754	0.43	0.127
Soc. Sec. inc.	0.164×10^{-3}	0.76	56.011	-0.153	-0.68	53.381
Education b/						
Initial	-3.392	-0.13	0.008	-.-	-.-	-.-
Primary	0.289	1.69	0.505	12.162	0.08	0.606
Secondary	0.155	0.77	0.228	513.664	2.85	0.164
Technical	-0.473	-0.98	0.036	1548.570	2.22	0.006
Post-secondary	0.154	0.38	0.024	20.573	0.05	0.018
University	0.086	0.33	0.105	279.492	1.06	0.055
Household Characteristics						
Age	0.196	3.26	57.292	0.414	0.05	63.964
Age squared	-0.001	-2.48	3371.800	-.-	-.-	-.-
Non-married	0.029	0.14	0.070	-133.580	-0.73	0.121
Female	0.482	3.64	0.203	218.701	1.50	0.388
Ill	0.052	0.48	0.538	-220.655	-1.97	0.636
Unemployed	0.360	3.13	0.316	-82.045	-0.71	0.545
Homeowner	0.282	2.36	0.686	-46.327	-0.39	0.764
Num. Young c/	-0.056	-0.29	0.971	-124.602	-0.69	1.08
Young School d/	0.115	0.60	0.935	102.624	0.56	1.04
No Young	-0.146	-0.98	0.531	-.-	-.-	-.-
H.H. size	-0.009	-0.43	5.338	26.080	1.16	4.56
Inv. Mill's ratio	-.-	-.-	-.-	-17.011	-0.08	1.23
Constant	-8.95	-4.67	1.00	134.826	0.14	1.00
Recipients		165		Observations	165	
Observations		1121		R-squared	0.21	
Log likelihood		-380.57		F-statistic	2.121	
Dependent variable mean		0.147			235.553	

a/ In probit analysis, dependent variable is transfer receipt--transfer receipt=1 if transfer received, 0 otherwise. In Generalized Tobit analysis, dependent variable is net transfer amount received. Sample: Households aged 45 or over.

b/ The reference category is no education.

c/ Number of children living outside the household.

d/ Number of children living outside the household who are in school.

probability of transfer receipt by 11 percentage points. The level of social security income is positively related to the probability of transfer receipt, but its effect is negligible and not statistically significant. Non-social security income (labeled simply "income" in Table 5.1) is inversely related to transfer receipt, but the effect is small and not significant. At sample means, a 1,000 inti increase in income reduces the probability of receiving a transfer by only a third of a percentage point. So the most important income measure in the transfer probit is the dummy for receipt of Social Security income.

The probability of receiving a transfer rises with age, up to age 83, then declines. At sample means (age 57) being one year older raises the probability of transfer receipt by 1.7 percentage points. The probit results indicate that transfers are targeted toward female-headed households, the unemployed and homeowners. But education is only weakly related to transfer receipt.

The PLSS asked households to report the number of children living outside the household, but, unfortunately, asked only about those under the age of 30. The variable "Num. young" is the number of young children (under 30) living outside the household, and "Young School" is the number of them in school. And "No Young" is a dummy that takes a value of unity if "Num. Young" equals zero. None of these variables have coefficients significantly different from zero. Over half of the transfer recipients have no young children outside the household, so they must be receiving transfers from children over 30.

The generalized Tobit estimates are given in the last three columns of Table 5.1. Transfer amounts are higher for those with secondary and technical education (the reference category is no education) and lower for those who are ill. Amounts are also higher for female-headed households, larger households and university graduates; these coefficients are measured

less precisely. None of the income measures in the generalized Tobit is statistically significant.

Equations for transfers given by younger to older generations are presented in Table 5.2. The sample is restricted to households having at least one living parent. The probability of giving a transfer rises with earnings, but at a diminishing rate. At sample means, a 1,000 inti increase in earnings raises the probability of giving a transfer by a half a percentage point. The probability of giving also increases with other income. Education has a negligible effect on the probability of giving. The probability of giving a transfer rises with age up to age 34, then falls. Female-headed households and the unemployed are less likely to give, but the ill are more likely to, though the coefficient on illness is significant at only the .15 level.

Education levels of parents and spouse's parents are included as indicators of pre-transfer resources of older generation members, and they indicate a mixed pattern for transfers given. For example, the probability of giving is inversely related to the mother's education but positively related to the spouse's mother's education.

Generalized Tobit estimates for transfer amounts given are presented in the right-hand columns of Table 5.2. Transfer amounts given increase with donor earnings but, as in the probit equation for giving, education has a negligible effect on donations. The non-married give more, and amounts given increase with the mother's education.

E. Effects of Social Security on Transfers from Young to Old

We use the estimates in Tables 5.1 and 5.2 to answer the following question: How would private transfers change if social security pension benefits were taken away? We answer this question by comparing predicted transfers with and without social security.

Table 5.2. Probit and Generalized Tobit Estimates
Transfers from Young to Old
Transfers Given a/

Variable	Probit Coefficient	Probit Asymptotic t-value	Probit Mean	Generalized Tobit Coefficient	Generalized Tobit t-value	Generalized Tobit Mean
Income						
Earnings	0.105×10^{-3}	2.79	1821.900	0.022	6.15	2171.100
Earnings sqd.	-0.472×10^{-8}	-1.79	0.142×10^{8}	-.-	-.-	-.-
Other inc.	0.392×10^{-3}	1.94	43.176	-0.036	-0.79	46.174
Education b/						
Initial	0.854	1.49	0.004	-66.137	-0.63	0.008
Primary	-0.116	-0.42	0.359	-8.458	-0.14	0.212
Secondary	0.097	0.34	0.331	-47.472	-0.76	0.388
Technical	0.081	0.26	0.058	-4.453	-0.07	0.069
Post-secondary	0.178	0.55	0.046	-60.356	-0.88	0.069
University	0.152	0.51	0.157	-39.232	-0.60	0.237
Household Characteristics						
Age	0.267	3.03	42.931	0.700	0.64	37.976
Aged squared	-0.006	-3.01	1996.700	-.-	-.-	-.-
Age cubed	0.368×10^{-4}	2.74	99945.000	-.-	-.-	-.-
Non-married	0.151	0.65	0.037	139.393	2.85	0.037
Female	-0.386	-2.38	0.172	-8.225	-0.23	0.057
Ill	0.119	1.50	0.501	-13.187	-0.84	0.510
Unemployed	-0.175	-1.49	0.217	40.985	1.62	0.110
Homeowner	-0.081	-0.98	0.535	11.853	0.74	0.441
H.H. size	-0.119	-0.95	5.234	-4.085	-0.98	5.004
Num. par. b/	0.062	-1.41	2.430	-10.677	-1.25	2.796
Fath. ed.	0.017	1.22	4.670	-3.510	-1.27	5.306
Moth. ed.	-0.038	-2.28	3.106	7.872	2.31	3.396
Sp. fath. ed. c/	-0.020	-1.56	4.676	0.863	0.32	4.833
Sp. moth. ed. c/	0.036	2.29	2.542	7.076	2.21	3.437
Inv. Mill's ratio	-.-	-.-	-.-	83.623	-2.10	1.444
Constant	-4.892	1.31	1.000	189.833	1.87	1.000

Donors	245	Observations	245
Observations	1875	R-squared	0.35
Log likelihood	-656.84	F-statistic	5.67
Dependent variable mean	0.131		141.386

a/ In probit analysis, transfer given--transfer given=1 if transfer given, 0 otherwise. In Generalized Tobit analysis, dependent variable is net transfer amount given. Sample: Households whose heads or spouses have at least one parent living.

b/ Number of head's and spouse's parents alive.

c/ Spouse's parent's education.

1. Simulation Results

Predicted transfers are the product of the predicted transfer probability and the predicted amount. Predicted transfer amounts are the products of the estimated coefficient vector and the vector of explanatory variables:

$$\text{Predicted} = F(\hat{a}_0 + \hat{a}I_h + \hat{b}X_h) \times (\hat{c}_0 + \hat{c}I_h + \hat{d}X_h), \qquad (5.4)$$

where F is the normal distribution function.[20] Predicted transfers with Social Security removed is equation (5.4) with social-security related elements of the vector I_h set to zero. Results for transfers from young to old are as follows:

Actual mean	34.67
Predicted mean	35.07
Predicted mean with social security income set to zero	40.19

Removing social security causes a 5.12 inti increase in predicted private transfers received by older generations from younger ones. For the whole sample, this implies a total boost in transfers of 5,740 intis (5.12 x 1,121). Thus, total transfers from young to old in the sample would rise from 38,865 to 44,605. The boost in transfers amounts to 12.9 percent of pre-Social Security transfers (5,740/44,605).

The 12.9 percent figure does not take into account the effects of social security's removal on giver behavior. Taking away social security increases the disposable earnings of potential givers and, as the results in Table 5.2 indicate, giving is positively related to earnings. We assume the social security tax is fully shifted to workers so that they, in effect, pay a tax rate of 19 percent. Removing the tax would raise

---

20/ Note that predicted transfer amounts are not conditioned on actual transfer status (the inverse Mill's ratio terms and their coefficients are not used in the imputations). The predicted amounts, then, have the interpretation of expected values of a random draw from the population conditional on the vector.

disposable earnings by 1/(1-.19) = 23 percent. Performing the calculations above for the equations in Table 5.2 yields a predicted increase of 1.78 intis.[21] Using the sample in Table 5.1 as a basis for the aggregate calculation yields 1.78 x 1,121 = 1,995 extra intis transferred due to donor earnings effects. This implies aggregate transfers of 44,605 + 1,995 = 46,600. The estimated reduction in transfers due to social security is (1,995 + 5,740)/46,600 = 16.6 percent. Another way to express the results is that, without social security, private transfers from young to old would have been 20 percent larger ((1,995 + 5,740)/38,865).

These simulation results indicate that social security has a significant impact on private transfers, but its effect is less than the Barro-Becker prediction of complete crowding out. We now take a closer look at the estimates in Tables 5.1 and 5.2 and interpret them in the light of alternative transfer motives.

2. Implications for Transfer Motives

The evidence on transfer motives in Tables 5.1 and 5.2 is mixed, but the evidence in Table 5.1 does cast doubt on the strict Barro-Becker altruism motive for private transfers. The altruism model predicts an inti for inti reduction in private transfers with increases in recipient pre-transfer income. Instead, two of the income measures in the generalized Tobit equation in Table 5.1 are positively related to transfer amounts (though the coefficients are not statistically significant). And the negative coefficient (social security income) is significantly different from -1 at the .01 level.

21/ Actual transfers given for the sample in Table 5.2 is 13.10 intis. Predicted transfers from the equations in Table 5.2 were 12.45, and predicted transfers without social security were 14.23, a difference of 1.78. Note that average transfers given is much smaller than average transfers received. A potential explanation for the discrepancy is the possibility of multiple donors when children make transfers to parents.

Moreover, while the probit coefficient on receipt of social security income is negative, which suggests altruism, probit results are a less discriminating test of transfer motives. The reason is that negative coefficients on income in the probit are consistent with exchange motivated transfers as well. For example, having less income lowers the supply price of providing inter-family services which increases the probability of receiving an exchange related transfer (Cox, 1987). The same argument applies to the positive coefficient on unemployment status in the probit in Table 5.1.

Another result that is counter to the altruism hypothesis is the finding that older households who are ill receive less than those who are not. This result, however, is consistent with inter-family exchange if those who are ill provide fewer services than those who are not.

One problem with making inferences about transfer motives from Table 5.1, however, is the lack of information about potential donor income. For example, a possible reason why the coefficient for recipient income is positive is that the characteristics of potential donors are omitted from the equation. Positive correlation between recipient and donor incomes imparts an upward bias to the income coefficients in Table 5.1.

The evidence casts doubt on some versions of the exchange hypothesis as well. For example, the findings for giving behavior in Table 2 indicate that education is only weakly related to transfers given. If transfers from young to old were repayments for educational loans, we would expect them to be positively related to education.

Some of the evidence, however, is consistent with inter-family exchange. For example, the findings in Table 5.1 indicate that females are much more likely to receive transfers. This evidence is consistent with

evidence from other countries (Lucas and Stark, 1985; Botswana, Kaufmann and Lindauer, 1986; El Salvador, Cox, 1987; United States). Part of the reason for the gender difference in transfers received may be due to the possibility that women are more involved in inter-family exchange of in-kind services. "Altruistic" explanations, such as women being compensated for deficiencies in earning potential, are less convincing since the estimates control for income. Part of the gender difference could also be due to gender differences in life expectancy, resulting in a targeting of private transfers to widows.

Further, some of the evidence points to an insurance function of transfers. For example, those who are ill are actually more likely to give a transfer (coefficient significant at the .15 level). One explanation is that those prone to illness due to, say lack of good water supplies, could form insurance schemes with similar households, possibly including their parents. This type of scheme would increase the incidence of both gifts and receipts among households who are affected by illness. Similarly, unemployed donors give larger amounts to their parents than non-unemployed donors (coefficient significant at the .10 level), which is consistent with the private insurance idea.

F. Social Security Health Coverage and Private Transfers

Next we gauge the connection between social security health coverage and private transfers. Table 5.3 contains probit and generalized Tobit estimates for transfers received using the entire sample. The dummy variable for illness is interacted with a dummy variable for social security coverage. The latter takes on a value of one if the household pays Social Security taxes and of zero otherwise.

Table 5.3. Probit and Generalized Tobit Estimates
Entire Sample
Transfers Received a/

Variable	Probit Coefficient	Probit Asymptotic t-value	Probit Mean	Generalized Tobit Coefficient	Generalized Tobit t-value	Generalized Tobit Mean
Income						
Income	-0.372×10^{-4}	-2.61	1946.900	0.011	0.94	1392.400
Education						
Initial	0.060	0.14	0.005	88.514	0.24	0.005
Primary	0.112	0.80	0.388	-15.317	-0.14	0.396
Secondary	0.124	0.80	0.315	129.930	1.03	0.322
Technical	-0.017	-0.09	0.052	53.442	0.32	0.042
Post-secondary	0.202	0.95	0.041	145.247	0.83	0.040
University	0.095	0.53	0.145	276.018	1.85	0.125
Household Characteristics						
Age	-0.176	-3.37	45.855	0.127	0.07	46.972
Age squared	0.003	2.69	2296.900	-.-	-.-	-.-
Age cubed	-0.137×10^{-4}	-1.98	0.124×10	-.-	-.-	-.-
Non-married	-0.154	-1.14	0.060	-61.707	-0.59	.076
Female	0.470	5.42	0.163	192.741	2.54	0.276
Ill, no SS b/	0.246	3.50	0.303	-92.336	-1.44	0.398
Ill, has SS c/	0.128	1.62	0.204	-113.391	-1.59	0.199
Unemployed	0.393	5.42	0.242	143.201	1.98	0.394
Homeowner	-0.041	-0.63	0.563	61.328	1.09	0.542
H.H. size	0.017	1.28	5.140	28.686	2.59	4.866
Num. Young d/	-0.183	-1.47	0.635	-24.957	-0.24	0.565
Young School e/	0.181	1.40	0.593	23.331	0.22	0.539
Fath. ed.	0.013	1.14	4.553	19.645	2.08	4.718
Moth. ed.	0.494×10^{-3}	0.04	3.+55	-0.855	-0.09	3.114
Inv. Mill's ratio	-.-	-.-	-.-	60.303	0.47	1.139
Constant	2.050	2.53	1.00	-248.905	-1.00	1.000

Recipients	568	Observations	568
Observations	2241	R-squared	0.08
Log-likelihood	-1171.10	F-statistic	2.43
Dependent variable mean	0.253		226.891

a/ In probit analysis, dependent variable is transfer receipt--transfer=1 if transfer received, 0 otherwise. In Generalized Tobit analysis dependent variable is net transfer amount received.

b/ Ill during the last four weeks and not covered by social security.

c/ Ill during the last four weeks and covered by social security.

d/ Number of children living outside the household.

e/ Number of children living outside the household who are in school.

The probit results indicate that being ill and not being covered by social security raises the probability of transfer receipt by 8.4 percentage points. Being ill and covered by social security raises the probability of transfer receipt as well, but only by about half as much. The difference is significant at the .25 level. The point estimates for the generalized Tobit indicate that the ill without Social Security coverage receive more than the ill with coverage, but the estimates are imprecise.

We use the same technique above to figure the boost in private transfers that would occur if social security were removed. The prediction is a 2.6 inti increase in private transfers targeted to households affected by illness. The average transfer received for the entire sample is 57.51 intis. The results imply that transfers would be 4.5 percent higher without social security health coverage.

G. Conclusions

In Peru, private inter-household transfers make an important contribution to the income of vulnerable groups such as the elderly. This has an important public policy implication; namely that the effects of public transfers to such vulnerable groups may be mitigated if private transfers are reduced. There is some evidence that this happens in Peru. Households whose heads receive social security pension income are less likely (by 11 percent) to receive private transfers. Without social security, the amount of private transfers from young to old would have been 20 percent larger. There is also some evidence that private transfers compensate for the availability of public health benefits.

While significant, these findings are not consistent with a purely altruistic model of giving, which predicts a one-to-one substitution for public giving. They are consistent with theories of exchange and private insurance.

REFERENCES

Adams, James D. 1980. "Personal Wealth Transfers." Quarterly Journal of Economics 95 (August): 159-79.

Ainsworth, Martha. 1989. "Child Fostering and the Demand for Child Labor in Côte d'Ivoire," Department of Economics, Yale University.

Barro, Robert J. 1974. "Are Government Bonds Net Wealth?" Journal of Political Economy 82 (November/December): 1095-1117.

Becker, Gary S. 1974. "A Theory of Social Interactions." Journal of Political Economy 82 (November/December): 1063-93.

Behrman, Jere R. and Deolalikar, Anil B. 1987. "Interhousehold Transfers in Rural India: Altruism of Exchange?" Mimeographed. Philadelphia, PA: University of Pennsylvania.

Bernheim, B. Douglas, Shleifer, Andrei, and Summers, Lawrence H. 1985. "The Strategic Bequest Motive." Journal of Political Economy 93 (December): 1045-76.

Butz, William P. and Stan, Peter J.E. 1982. "Household Composition and Interhousehold Exchange in Malaysia," Population and Development Review 8 (March): 92-115.

Cox, Donald. 1987a. "Motives for Private Income Transfers". Journal of Political Economy, 95 (June): 508-46

Cox, Donald. "Intergenerational Transfers and Liquidity Constraints," Quarterly Journal of Economics, (Forthcoming).

Cox, Donald and Raines, Fredric. 1985. "Interfamily transfers and Income Redistribution." In Horizontal Equity, Uncertainty, and Measures of Well-Being. Martin David and Timothy Smeeding (eds.), Chicago: University of Chicago Press (for NBER).

Cox, Donald and Jakubson, George. 1989. "The Connection Between Public Transfers and Private Interfamily Transfrs." Mimeographed. Chestnut Hill, MA: Boston College.

Cox, Donald and Rappelli, George. 1989. "Credit Rationing and Private Transfers: Evidence from Survey Data". Mimeographed. Chestnut Hill, MA: Boston College.

Glewwe, Paul. 1988. Distribution of Welfare in Peru 1985-86." Living Standards Measurement Study Working Paper No. 42. The World Bank.

Glewwe, Paul and van der Gaag, J. 1988. "Confronting Poverty in Developing Countries: Definitions, Information and Policies." Living Standrds Measurement Study Working Paper No. 48. The World Bank.

ILC. 1987. The Cost of Social Security, 1981-83. Geneva.

Johnson, G.E. and Whitelaw, W.E. 1974. "Urban-Rural Income Transfer in Kenya: An Estimated-Remittances Function." Economic Development and Cultural Change, (April): 473-79.

Kaufmann, Daniel. 1982. "Social Interaction as a Strategy for Economic Survival Among the Urban Poor: Theory and Evidence." Unpublished Ph.D. Dissertation, Harvard University.

Kaufmann, Daniel and Lindauer, D. L. 1986. "A Model of Income Transfers for the Urban Poor". Journal of Development Economics, 22 (July/August): 337-350.

Knowles, J.C. and Anker, Richard. 1981. "An Analysis of Income Transfers in a Developing Country." Journal of Development Economics 8 (April): 205-226.

Kotlikoff, Laurence J. and Spivak, Avia. 1981. "The Family as an Incomplete Annuities Market." Journal of Political Economy 89 (April): 372-91.

Kotlikoff, Laurence, Razin, Assaf and Rosenthal, Robert W. 1988. "A Strategic Altruism Model in Which Ricardian Equivalence Does Not Hold." Mimeographed. Boston, MA: Boston University.

Leibenstein, Harvey. 1975. "The Economic Theory of Fertility Decl[illegible]." Quarterly Journal of Economics 93 (October): 901-18.

Lucas, Robert E.B. and Stark, Oded. 1985. "Motivations to Remit: Evidence from Botswana." Journal of Political Economy 93 (October): 901-18.

McElroy, Majorie B. and Horney, Mary Jean. 1981. "Nash-Bargained Household Decisions: Towards a Generalization of the Theory of Demand." International Economic Review 22 (June): 333-49.

Menchik, Paul L. and David, Martin. 1983. "Income Distribution, Lifetime Savings, and Bequests." American Economic Review 83 (September): 672-90.

Nugent, Jeffrey B. 1985. "The Old-Age Security Motive for Fertility." Population and Development Review, 11 (March): 75-97.

Ravallion, M. and Dearden, Lorraine. 1988. "Social Security in a 'Morale Economy: An Empirical Analysis for Java". Review of Economics and Statistics, 70 (February): 36-44.

Rempel, Henry and Lobdell, Richard A. 1978. "The Role of Urban-to-Rural Remittances in Rural Development". Journal of Development Studies, 14 (April): pp. 324-41.

Rosenzweig, Mark R. and Wolpin, Kenneth, I. 1985. "Specific Experience, Household Structure, an Intergenerational Transfers: Farm Family Land and Labor Arrangements in Developing Countries". Quarterly Journal of Economics 100 (Supplement): 961-87.

Stark, Oded, Taylor, J. Edward and Yitzhaki, Shlomo. 1986. "Remittances and Inequality." The Economic Journal 96 (September): 722-740.

Stark, Oded, Taylor, J. Edward and Yitzhaki, Shlomo. 1988. "Migration, Remittances and Inequality: A Sensitivity Analysis Using the Extended Gini Index." Journal of Development Studies, 28: 309-322.

Suarez-Berenguela, R. M. 1987. "Financing the Health Care Sector in Peru." Living Standards Measurement Study Working Paper No. 31, The World Bank (April).

Tomes, Nigel. 1981. "The Family, Inheritance, and the Intergenerational Transmission of Inequality." Journal of Political Science 89 (October): 928-58.

United States Social Security Administration (SSA). 1987. Social Security Program Throughout the World, Washington, D.C.: Government Printing Office.

Vlassoff, Michael and Vlassoff, Carol. 1980. "Old Age Security and the Utility of Children in Rural India." Population Studies 34: 487-99.

World Bank. 1989. World Development Report, Oxford University Press.

PPR Working Paper Series

	Title	Author	Date	Contact for paper
WPS323	The Old and the New in Heterodox Stabilization Programs: Lessons from the 1960s and the 1980s	Miguel A. Kiguel Nissan Liviatan	December 1989	R. Luz 61588
WPS 324	Ethical Approaches to Family Planning in Africa	F. T. Sai K. Newman	December 1989	S. Ainsworth 31091
WPS325	Manufacturers' Responses to Infra-structure Deficiencies in Nigeria	Kyu Sik Lee Alex Anas	December 1989	L. Victorio 31015
WPS326	Do Exporters Gain from VERs?	Jaime de Melo L. Alan Winters		
WPS327	Making Noisy Data Sing: Estimating Production Technologies in Developing Countries	James R. Tybout		
WPS328	Europe, Middle East, and North Africa (EMN) Region Population Projections, 1989-90 Edition	Rodolfo A. Bulatao Eduard Bos Patience W. Stephens My T. Vu	November 1989	S. Ainsworth 31091
WPS329	Latin America and the Caribbean (LAC) Region Population Projections, 1989-90 Edition	Rodolfo A. Bulatao Eduard Bos Patience W. Stephens My T. Vu	November 1989	S. Ainsworth 31091
WPS330	Africa Region Population Projections, 1989-90 Edition	Rodolfo A. Bulatao Eduard Bos Patience W. Stephens My T. Vu	November 1989	S. Ainsworth 31091
WPS331	Asia Region Population Projections, 1989-90 Edition	Rodolfo A. Bulatao Eduard Bos Patience W. Stephens My T. Vu	November 1989	S. Ainsworth 31091
WPS332	India: Effective Incentives in Agriculture: Cotton, Groundnuts, Wheat, and Rice	Ashok Gulhati		
WPS333	Secondary Market Prices under Alternative Debt Reduction Strategies: An Option Pricing Approach with an Application to Mexico	Stijn Claessens Sweder van Wijnbergen		
WPS334	Built-in Tax Elasticity and the Revenue Impact of Discretionary Tax Measures: An Econometric Estimation Method with Application to Malawi and Mauritius	Jaber Ehdaie		

PPR Working Paper Series

	Title	Author	Date	Contact for paper
WPS335	Macroeconomic Adjustment and the Labor Market in Four Latin American Countries	Ramon E. Lopez Luis A. Riveros	December 1989	L. Riveros 61762
WPS336	Complementary Approaches to Financing Health Services in Africa	Germano Mwabu		
WPS337	Projecting Mortality for All Countries	Rodolfo A. Bulatao Eduard Bos Patience W. Stephens My T. Vu	December 1989	S. Ainsworth 31091
WPS338	Supply and Use of Essential Drugs in Sub-Saharan Africa: Issues and Possible Solutions	S. D. Foster		
WPS339	Private Investment and Macro-economic Adjustment: An Overview	Luis Serven Andres Solimano	December 1989	E. Khine 61763
WPS340	Prudential Regulation and Banking Supervision: Building an Institutional Framework for Banks	Vincent P. Polizatto		WDR Office 31393
WPS341	Cost-of-Living Differences between Urban and Rural Areas of Indonesia	Martin Ravallion Dominique van de Walle	December 1989	C. Spooner 30464
WPS342	Human Capital and Endogenous Growth in a Large Scale Life-Cycle Model	Patricio Arrau	December 1989	S. King-Watson 33730
WPS343	Policy Determinants of Growth: Survey of Theory and Evidence	William R. Easterly Deborah L. Wetzel	December 1989	R. Luz 61588
WPS344	Policy Distortions, Size of Government, and Growth	William Easterly	December 1989	R. Luz 61588
WPS345	Private Transfers and Public Policy in Developing Countries: A Case Study for Peru	Donald Cox Emmanuel Jimenez	December 1989	A. Bhalla 60359
WPS346	India. The Growing Conflict between Trade and Transport: Issues and Options	Hans Jurgen Peters		
WPS347	Housing Finance in Developing Countries: A Transaction Cost Approach	Robert M. Buckley	December 1989	WDR Office 31393